

NOVEMBER 1919 ~ No 166

Monthly

A Reference for Buyers

HITCHCOCK'S
**MACHINE
TOOL LIST**

Distributed Free to Machine Tool
Users Everywhere in the United States and to
Dealers in American Machinery Abroad

Published by
A-H HITCHCOCK
1220-1235 Caxton Building
Chicago

Type A S Adjustable Speed RELIANCE MOTORS

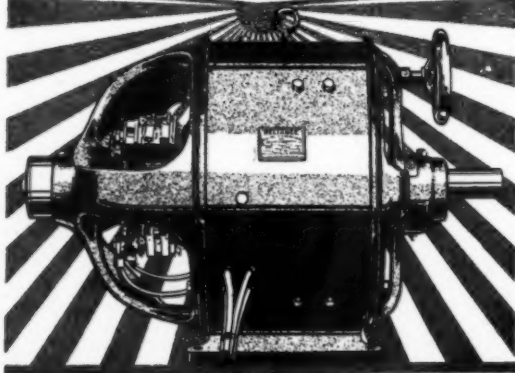
For Machine Tools

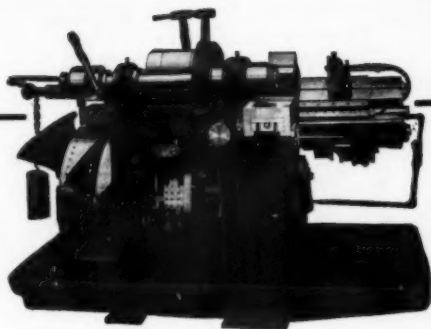
Type A S Reliance Motors have all the features necessary to make machine tools turn out every job in record time. It pays to use them.

Bulletin 1014 shows how others have done it

Reliance Electric & Engineering Co.
1050 Ivanhoe Road, Cleveland, Ohio

Branch Offices:
New York, Philadelphia, Pittsburgh
Chicago





GRIDLEY SINGLE SPINDLE AUTOMATICS

CAPACITIES UP TO 5"

Complete data on request

THE NATIONAL ACME CO.
WINDSOR, VERMONT

General Offices, Cleveland, O. Canadian Screw Plant, Montreal, P. Q.

Branch Offices:

NEW YORK

BOSTON

CHICAGO

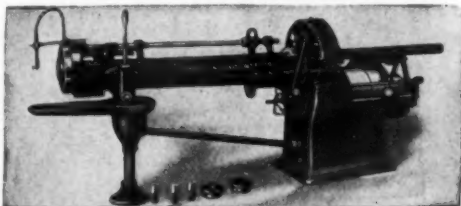
Detroit

WAREHOUSES—NEW YORK, CHICAGO

With FOREIGN REPRESENTATIVES

Makers of Gridley Single and Multiple-Spindle Automatics at Windsor, Vt., and Acme Automatics, Threading Dies and Screw Machine Products at Cleveland, Ohio

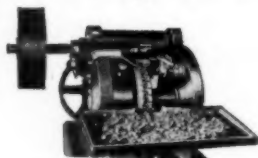
**This is only one of the
11 TYPES - 5 SIZES
Ask for a complete catalog**



J.N. LAPOINTE CO.
NEW LONDON, CONN.

Makers of Broaching Machines and Broaches.

Castellating Machine



**Production on one-fourth to one-half inch Nuts
400 to 700 per hour**

Does a clean, accurate job.

Enquire of your dealer or write us for full details.

THE CRAFTSMAN TOOL CO.
CONNEAUT, OHIO



DELIVERY

Speeding up production is a matter of equipment. Check your cutter equipment by catalog 27S and make it complete with

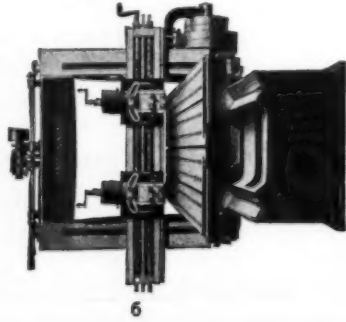
**Brown & Sharpe
Milling Cutters**

We are offering prompt deliveries.

**BROWN & SHARPE
MFG. CO.
PROVIDENCE, R. I.**

Time-Saving Planers and Boring Mills

By Saving Time They Increase Output and Lower Costs



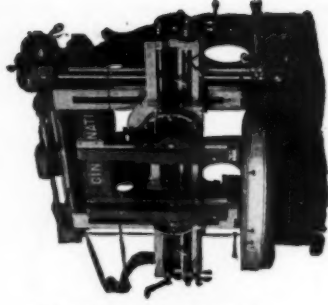
Cincinnati Tu-Speeds

Compared with the Cincinnati Tu-Speed, the average planer is costly, because it kills time. The Tu-Speed *saves time*—therefore increases output and lowers costs—by providing two cutting speeds, instantly available, for work of a different character, such as roughing and finishing. All our belt-driven planers from 22" to 56" have the time-saving Patent Tu-Speed Drive.

Cincinnati Boring Mills

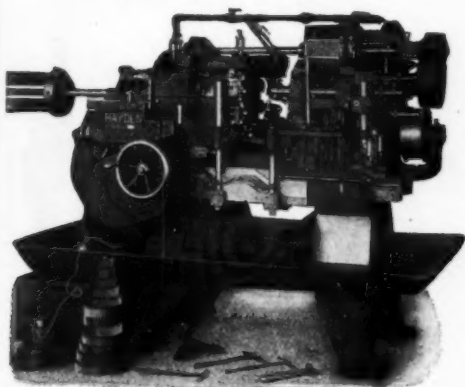
Are time-saving efficiency tools for efficient boring. Made in sizes 8, 10 and 12 ft. in the spur gear type. Boring and turning mills of the bevel gear type are furnished 5, 6 and 7 ft.

*Just give us a chance
to save YOUR time*



THE CINCINNATI PLANNER CO., - CINCINNATI, OHIO, U.S.A.

A Piece Every $2\frac{1}{2}$ to 36 Seconds That Tells the Story



Cincinnati Automatic 5-Spindle Screw Machine

Of course production is the main thing, and "one piece every $2\frac{1}{2}$ to 36 seconds" tells the story.

But back of this is a story of ingenious design and careful construction that you will find both interesting and profitable to read.

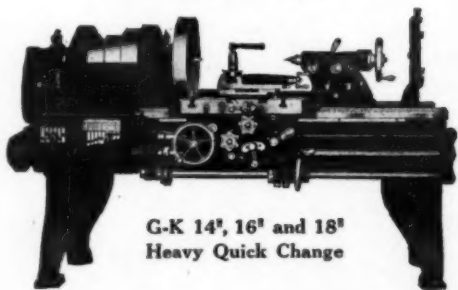
The combination of time, skill, experience and money that were expended on this machine, produced 48 features of distinct superiority before we were satisfied.

*The Catalog describes those 48 superior features
Glad to mail it to you—will you say the word?*

Cincinnati Automatic Machine Co.
Oakley, Cincinnati, Ohio

G-K Engine Lathes

From 14 to 30 Inch



G-K 14", 16" and 18"
Heavy Quick Change

The G-K Way

Every G-K Lathe is designed and built to give to its users a machine that will meet every requirement accurately and rapidly and give the greatest convenience in operation. Any lathe which actually will accomplish those purposes is right at the top of the heap, and that is just what you can expect from every G-K.

G-K Betterments

Is the name of a book which clearly describes in detail the many improvements in the construction of G-K Lathes—practical improvements which add to its usefulness in everyday production. If its perusal leads you to install one or more of these excellent machines, you will be glad you read it.

Better write today for your copy

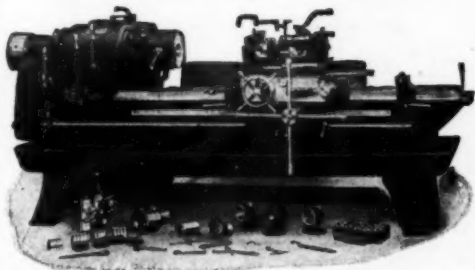
The Greaves-Klusman Tool Co.
Cincinnati, Ohio, U. S. A.

CINCINNATI-ACME

**3 1/4"x36" Bar Cap.
36" Chucking Cap.**

Flat Turret Lathe

For Both Bar and Chucking Work



Showing Equipment for Bar Work

Flat turret lathes are rapidly coming into their own for the machining of detail parts in quantities, and the Cincinnati-Acme has proven to be particularly valuable for that purpose because of its great rigidity, adaptability, ease of control and general excellence.

The head is cast solid with the bed—the only construction which makes possible the perfect and constant alignment of spindle with vees upon which carriage travels. A real centralized control saves time between operations. It is full of improvements for increasing its range of usefulness, saving time and promoting accuracy, which are fully explained in the Catalog.

We are at your service; are you ready?

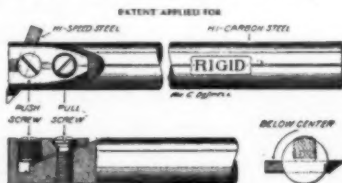
The Acme Machine Tool Co.
Cincinnati, Ohio, U. S. A.

A League of Notions

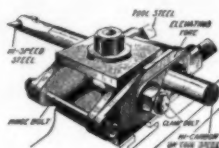
(In Boring Tools, 9 Bars of 1 type, 11 Holders of 5 types)

Duly Ratified by U. S. Government

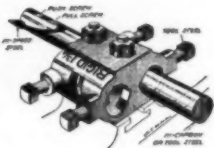
(In Numerous Orders, Re-Orders, etc.)



The Rigid Boring Bar



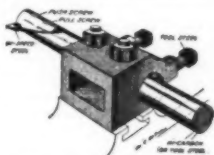
Adjustable Boring Tool



Double Reversible Boring Tool



Short Hold Boring Tool



Single Reversible Boring Tool

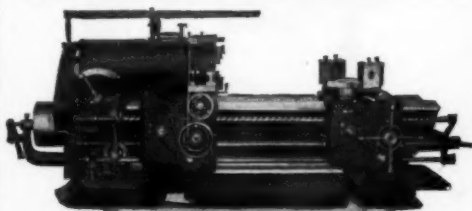
Large stock on hand. Shipped on 30 days' approval.

RIGID Tool Holder Co.
Washington, D. C.

STEINLE TURRET MACHINE CO.

MADISON, WISCONSIN

Originators of the Heavy Duty Full Swing Side Carriage Turret Lathe



Steinle 24" Full Swing Side Carriage Turret Lathe

Machine is regularly furnished belt driven or arranged for motor drive.

Actual swing over ways.....	24"
Swing over side carriage.....	21"
Diameter of hole through spindle.....	4" or 6 1/4"
Traverse of side carriage and of turret carriage.....	56"

Both carriages have independent quick change feed and independent power traverse all controlled from carriage aprons.

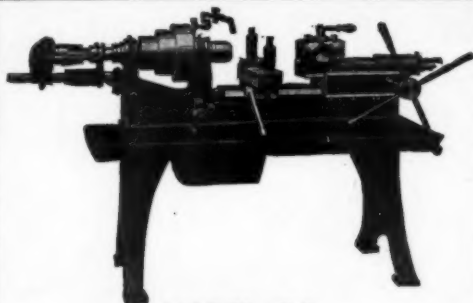
Side carriage can be run past the chuck and is equipped with cross slide having power cross feed and with turret tool block having four tool holders.

There are thirty reversible spindle speeds available. One belt or one motor furnishes power for all functions of the machine.

Turret is massive and designed particularly with a view to rigid support of tool equipment.

Send us drawings of gas engine fly wheels, cylinders where cast singly, pistons, and piston rings. Let us give you production estimates and the cost of tool equipment for these and other pieces and also let us tell you the time required to change the tool settings for the different pieces.

Numerous repeat orders received from many of the principal manufacturers of tractors, trucks, aviation motors, marine gas engines, and stationary engines demonstrate the satisfactory results obtained from the use of our machines.



MODEL "D"

Turret Lathes and Screw Machines

Now Ready for Delivery

**Designed for Rapid Manufacturing of
Parts Requiring Several Operations**

MADE IN FOUR SIZES:

- No. 2 { $1\frac{1}{16}$ " Wire Feed Capacity, Plain Head
 { $1\frac{1}{32}$ " Hole Through Spindle.
- No. 3 { $1\frac{5}{16}$ " Wire Feed Capacity, Plain Head
 { $1\frac{1}{8}$ " Hole Through Spindle.
- No. 4 { $1\frac{1}{2}$ " Wire Feed Capacity, Geared Head
 { $2\frac{1}{16}$ " Hole Through Spindle.
- No. 5 { $1\frac{7}{8}$ " Wire Feed Capacity, Geared Head
 { $2\frac{3}{8}$ " Hole Through Spindle.

**With or Without Power Feed to Turret Slide.
Mechanically Perfect and Fully Guaranteed.**

Manufactured By

Smurr & Kamen Company

328-330 N. Albany Ave., Chicago, Ill.

Nuclear Track The Stock

*This Job Complete in
2½ Minutes*

Technical drawing dimensions:
 Top: 2 1/2", 1 1/2", 1 1/2"
 Left: 3 1/2", 2 1/2", 1 1/2"
 Right: 1 1/2", 1 1/2", 1 1/2"
 Bottom: 1 1/2", 1 1/2", 1 1/2"
 Material: Malleable Iron

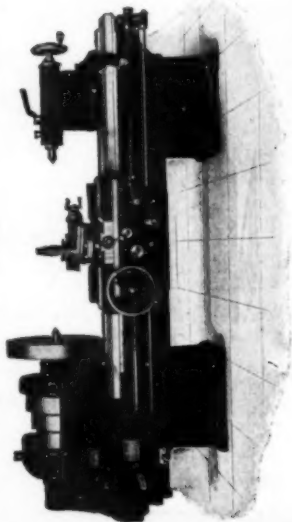
are accurate and productive. Fifteen years' of thoroughly tested service. A size for every class of manufacturing.

Catalog "H"—Its Free

WOOD TURRET MACHINE CO.

BRAZIL, INDIANA, U.S.A.

SIDNEY LATHES—For All Requirements



The Sidney Line of medium and heavy duty lathes includes a lathe for every class of work, regardless of the size or type of shop you are running.

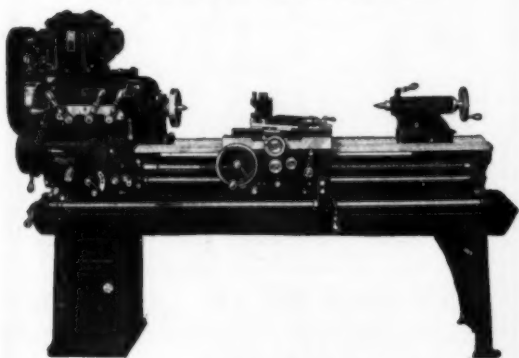
Lathes of medium duty in 14, 16, 18 and 20-inch swings, and of heavy duty in 15, 17, 19, 25, 27, 30 and 36-inch swings.

Send for Bulletin No. 45.

THE SIDNEY MACHINE TOOL CO., Sidney, Ohio

Willard MATTMAN BRATTEN Lathe

High Power—All Geared Head—Quick Change
Of Superior Build for the Tool Room



This is a high grade, up-to-the-minute machine which can be relied upon for maximum accurate production every day in the year. We ask you to note a few of its features:—

All gears are chrome nickel steel, and all sliding gears are hardened.

All speed changes are selective inside the headstock, and all gears in headstock run in oil.

There are available six direct speeds. Six further speeds are obtainable thru the back gears, or a total of 12 speeds.

It's impossible to throw in 2 speeds at the same time.

All shafts in the head are equipped with SKF ball bearings.

*It's a superior tool for honest, dependable work
Send for the Catalog and get the whole story*

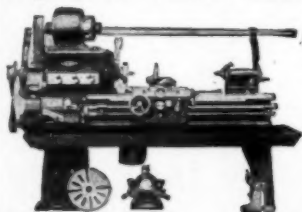
The Willard Machine Tool Co., Inc.

F Street, Box 784

CINCINNATI, O., U. S. A.

An Excellent Investment

High-Power "Filmith" Geared Head Lathe



**14" Swing
Q. C. Gear Box
And 12-Speed
Ball Bearing
Geared Head**

In construction it combines the cream of our experience with the most modern ideas in lathe building. Unusually rugged for its weight, with great power for its rated swing. Lowers costs, simplifies methods, increases production. *Write us today.*

PHILIP SMITH MFG. CO., SIDNEY, O.

Newman 5-Hole Tailstock Turret

Will Make Your Standard Lathe a Turret

Works as well or better than the best turret lathe. Very accurate and substantial. Especially valuable on long, hard runs.

**Will fit
any lathe**

**Attach in
15 seconds**

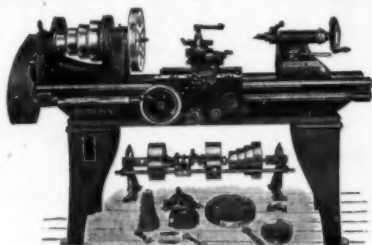
**Sent on
10 days'
trial**



A great aid to production. Why not test it for yourself?

NEWMAN MANUFACTURING CO., Cincinnati, O.

South Bend Lathe



Made with straight or gap bed.
Price includes equipment as shown in illustration

For the Machine and Repair Shops

13" Lathe	\$ 325	18" Lathe	\$ 700
15" Lathe	420	21" Lathe	900
16" Lathe	500	24" Lathe	1250

With Beds from 4 ft. to 16 ft. in length.

South Bend Lathes have been on the
market 13 years. Over 21,000 in use.

New York Office: - 2½ Murray Street
Boston Office: - - 65 Oliver Street
Philadelphia Office: - 33 N. Seventh St.

Free catalogue mailed on request

South Bend Lathe Works

Established 1906 South Bend, Ind. 430 E. Madison

Monarch Lathes



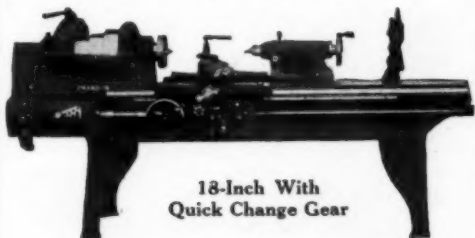
give universal satisfaction to the user. They have been doing this for years, and this accounts for the ever increasing demand for **Monarch Lathes.** Built in all styles and with any attachments desired.

Sizes 10 to 30-inch Swing

*Sold by a leading Machinery-Dealer
in every machinery center.*

The Monarch Machine Tool Co., Sidney, Ohio

The description of the "CHARD" is a story of super-quality



18-Inch With
Quick Change Gear

Made in sizes 16", 18", 20", 24" and 28"

Next to using a lathe—which is the one best test—the next best method is to study carefully its design and construction. When you read in our folders the details of how the "Chard" is built, you will want to be a "Chard" user—not because of any frills, but because of a practical mechanical excellence that means heavy cuts, stiffness, accuracy, convenience and flexibility. It is the result of over 35 years of intensive study in lathe building.

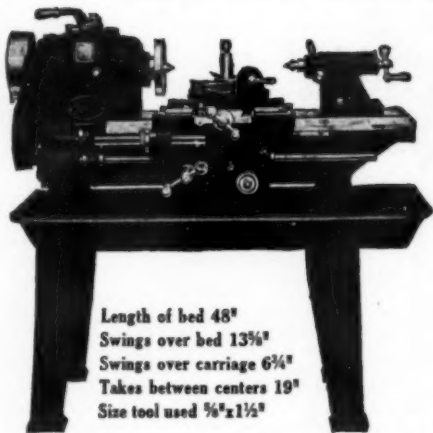
*To know the "Chard" is to want it
On what sizes shall we send information?*

Chard Lathe Company Newcastle, Ind.

DOMESTIC DISTRIBUTORS

THE F. O. STALLMAN SUPPLY CO., San Francisco, Cal.
VONNEGUT MACHINERY CO., Indianapolis, Ind.
ENGLISH & MILLER MACHINERY CO., Detroit, Mich.
OGDEN R. ADAMS, Rochester, N. Y.
THE W. M. PATTISON SUPPLY CO., Cleveland, Ohio.
J. S. MILLER MACHINERY CO., Pittsburgh, Pa.
MONARCH MACHINERY CO., Philadelphia, Pa.
DALE-BREWSTER CO., Chicago and New York.
THE BIGGS-WATTERSON CO., Dayton, Ohio.

**It's Good Business To Use
Adams Short-Cut Lathes**



Length of bed 48"
Swings over bed 13½"
Swings over carriage 6¾"
Takes between centers 19"
Size tool used ⅝"x1½"

Is it good business to run large lathes for turning quantities of short duplicate parts?

On Adams Short-Cut Lathes the investment, up-keep and operating costs are substantially less. And yet, within their capacity, they will turn out more work than a larger lathe, being more easily and rapidly handled. They are accurate, economical and efficient.

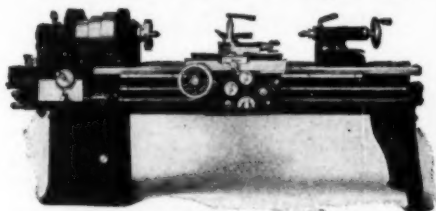
The floor space occupied is only 4'6"x2'4".

*High-grade in every particular
Glad to furnish complete information*

O. R. Adams Manufacturing Co., Inc.
Rochester, N. Y.

B. & E. 18" Engine Lathe

With Instantaneous Change Gear



Front Index Handle in Hole						1	2	3	4	5	6	7	8
Top Index Handle in Hole, 1	Cuts Threads per in.	2	2½	2½	2½	2½	3	3½	3½				
“ “ “ “ 2	“ “ “ “	4	4½	5	5½	5½	6	6½	7				
“ “ “ “ 3	“ “ “ “	8	9	10	11	11½	12	13	14				
“ “ “ “ 4	“ “ “ “	16	18	20	22	23	24	26	28				
“ “ “ “ 5	“ “ “ “	32	36	40	44	46	48	52	56				

Feeds 4 Times Threads per Inch *W.T. Emmes pat., Aug. 26, 1902, Oct. 28, 1902*

It's a great advantage to have instantly available any pitch or feed shown in the above index.

We call your attention to some others features found in this Lathe: Double back geared; double plate apron; reverse in the head for screw cutting, and reverse in the apron for feeds; power cross feed; longitudinal and cross feeds cannot be engaged when cutting screws; spindle is of the very best hammered crucible steel running in phosphor bronze bearings.

This modern lathe embodies the very best workmanship and materials thruout. Built to stand the stress of strenuous work.

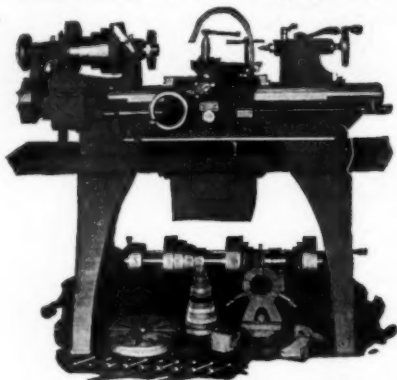
If you want the best at the right price, write us

The Boye & Emmes Machine Tool Co.

2245-2251 Spring Grove Ave., Cincinnati, Ohio

Worcester 12" and 14" Tool Room and Manufacturing Lathes

Are Small Lathes of Big Quality



12"x4' Worcester Tool Room Lathe

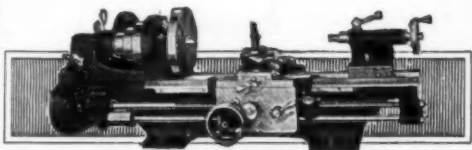
Furnished with Cone Head, as shown in cut, or with Geared Head for Motor Drive or Single Pulley Drive. Every Worcester Lathe, whether Tool Room or Manufacturing, is completely equipped for the purpose for which it is designed.

"Worcesters" are recognized everywhere as the standard small lathes, because of their mechanical excellence, their convenience of operation, and their ability to turn out a generous quantity of accurate work.

We have handsome folders of the various types

Worcester Lathe Company
68 Prescott St., Worcester, Mass.

"ADVANCING"



TYPE B-6 LATHES will be ready for delivery December 1st 1919. Ask about them.

During the past few years we have heard the word "RETREATING" so many times used, that when the cables or wireless flashed the word "ADVANCING" we all felt there was something good in store for us.

Yes ?



This Photograph shows
HUBERT DALTON PECK
"ADVANCING"

with a shovel removing the
first earth for the new and
permanent home of the

"DALTON SIX" Type B-4
and
"DALTON SIX" Type B-6
LATHES.

at Sound Beach, Connecticut,
- U.S.A. -

DALTON MANUFACTURING CORP. New York City U.S.A.
After February 1st 1920, Sound Beach, Connecticut, U.S.A.

A Practical Straightening Press

The "Towsley" Puts Bar Stock in Perfect Alignment

Repair work also done on bent journals, shaftings, axles, etc. Copper is used to avoid marring finish of drills, reamers, etc.



The "Towsley" enables one man to remove bends and short kinks from rough bar stock before it is put in the lathe, obviating low spots where lathe would leave rough surfaces.

Isn't this worth looking into?

JOHN T. TOWSLEY MFG. CO., 1037 Woodrow St., CINCINNATI, OHIO

Draw-in and Thrust Chucks

for Tool Room Lathes and Screw Machines. Look for the name "Hardinge Brothers" and write us. And did you ever ask us to make those—

Screw Machine Collets

with regular or irregular holes? We are prepared to make good deliveries. Why not try us next time? Quantities never too small or too large to interest us.

When making inquiry, kindly refer to "Chuck Department"

Hardinge Brothers, Inc.
Chicago, Ill.



NIVIN

METAL PARTS WASHING MACHINE

Washes Metal Parts Cuts Cost and Time in Half

From an International Harvester Plant the production chief reports:

"The Nivin Metal Parts Washing Machine in our plant does in half a day work that formerly required a full day's labor. But even if it didn't save any time at all the NIVIN does the work so much better that I would install it on that account alone."

The Nivin fits into any factory system, doing away with gasoline, open tanks and hand labor. The Nivin cuts operating time and labor cost in half. Every Nivin washed part is perfectly washed. The Nivin handles parts of all shapes and sizes.

We shall be pleased to give you detailed records of performance in plants with problems similar to your own.

Write for Literature

Your name on a card or on your letter-head will bring full details of the operation of the Nivin. This information is valuable to you. It puts you under no obligation to ask for it. Write for it today. (Or, tear off the bottom of this sheet—let your typist write your name on it—and mail it to us for literature.)

The Nivin Mfg. Company

843 Larrabee Street, Chicago

Canton Crane—"Handiest Tool in the Shop"

Does This Happen In Your Shop?



When a high-priced machinist has a job too heavy for him to lift—and the overhead crane is busy—does he call 5 to 9 other high-priced men from their work to assist him, giving the men a chance to "stall", while wasting much time and man-power?

OR THIS?—

Or does he get the *Canton Portable Crane*, hook it to the job and do it quickly and at a great saving to you? The "C. C." is useful for light and heavy weights alike—from 200 to 4000 lbs. It goes everywhere and is a one-man machine.

Ask for Booklet E-8 when you write
Your choice of many sizes

CANTON FOUNDRY & MCHE. CO., Canton, O.

ELECTRIC EUCLID HOISTS

Let OUR Engineers Save YOUR Time

It is possible that you realize the need of modern material handling equipment but cannot spare the time or men to work out the details.

Our engineers are constantly solving these difficulties and helping manufacturers reduce expenses.

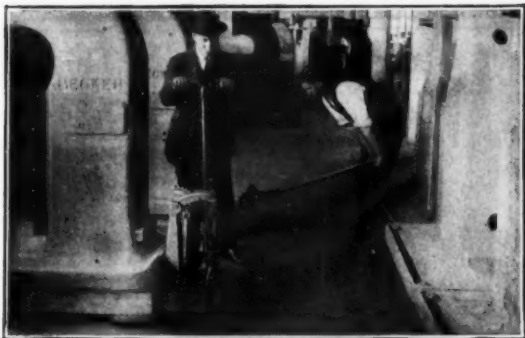
Furthermore, this service is absolutely free.

Will you take advantage of it?

The Euclid Crane & Hoist Co.

Dept. C

EUCLID, OHIO, U. S. A.



At the Nelson Blower & Furnace Co., Boston

Here is a Real Elevating Truck

The truck in the background will not lift the load because there isn't room to lower the handle, even though both trucks get under the platform. The Jacklift in the foreground *will lift it* because it lifts, if necessary, with the handle at the side.

This isn't all there is to the Jacklift

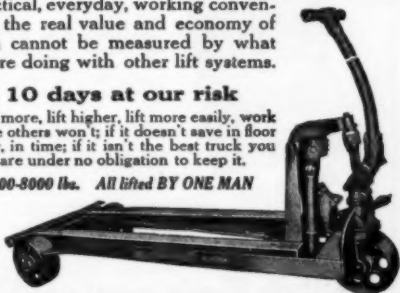
Its high lift, its one-man easy lift, its vertical lift, take the troubles out of your platform system, and make it a practical, everyday, working convenience, the real value and economy of which cannot be measured by what you are doing with other lift systems.

Try it 10 days at our risk

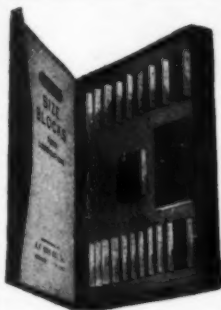
If it doesn't lift more, lift higher, lift more easily, work in places where others won't; if it doesn't save in floor space, in labor, in time; if it isn't the best truck you ever used, you are under no obligation to keep it.

Capacities 2500-8000 lbs. All lifted BY ONE MAN

Offices in the
Principal Cities



LEWIS-SHEPARD CO., 50 Binford St., BOSTON, MASS.



Think of This:

LOWAY

Size Blocks

Were expressly designed for every-day use, and at a price within the reach of every shop. They are of great value in setting up work on the machine, laying it out on the bench, checking, etc. The field of use is so broad that we consider this set one of the really necessary tools that machine shops should supply freely to their workmen.

Full details gladly sent

A. F. WAY CO., Inc., Hartford, Conn.

Export Department, 77 Broad St., New York City

Makers of "LOWAY" Sine Bar and Sine Square

Do You Know About These

Herlth Adjustable Parallels?



Indispensable in gauging slots, setting sine bars, height gauges and button snap gauges—in fact any female gauges. Obviate necessity of making special size-blocks for obtaining odd sizes.

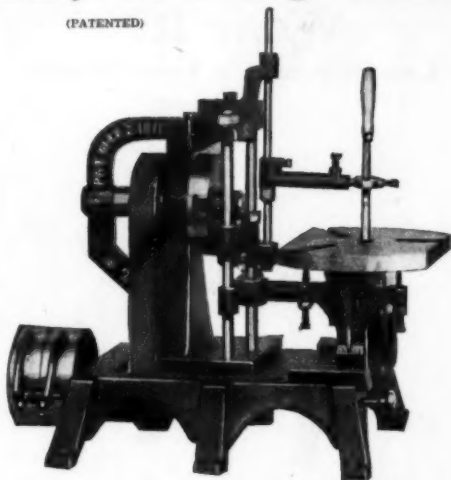
Made of especially prepared steel and thoroughly seasoned. They are tested for accuracy and will not change. *Surfaces guaranteed to be parallel:*

Do you want to look into them?

O. B. Herlth Manufacturing Co., 90 John St., Hartford, Conn.

Barry No. 2 Filing Machine

(PATENTED)



IF you have small work to handle, with even a moderate amount of filing, you will find the No. 2 Barry Filing Machine, patented, an invaluable piece of tool room and shop equipment. It becomes so naturally a part of your equipment that you will wonder how you worked without it.

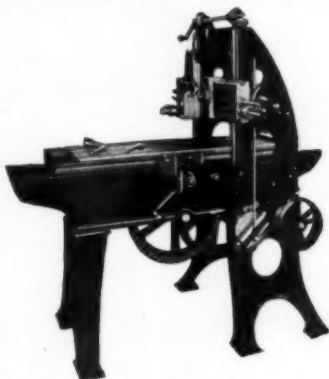
Write for catalogue 12 today.

Barry Manufacturing Company

515 West Monroe Street, Chicago, Ill.

"If the Shoe Fits— Wear It"

Lee Planers Fit Your Needs



Sizes: 16x16x42" and 16x16x54"

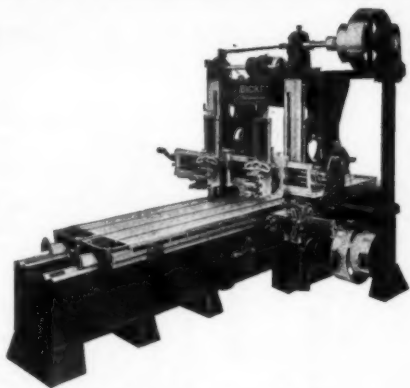
LEE Planers supply what heretofore has been a large need in the tool-room. Many jobs occur which are too small for most planers and yet too large for the average shaper. *Here is where the Lee Planers fit.* They are equally valuable for turning out large quantities of small work in the manufacturing department.

They are stiff, powerfully geared small machines of first-class workmanship. Their ease and rapidity of operation explain their great productive capacity and economy.

If the Lee fits your needs, why not use it?

The Frank H. Lee Co.

**MACHINERY DIVISION
Danbury, Conn., U. S. A.**



36"x36"x12' Bickett Metal Planer

THIS PLANER is built in the following table lengths: 8, 10, 12, 14 and 16 feet. The Planer is equipped with one Head on the cross rail, equalized Table Lubrication, Aluminum Driving Pulley and necessary Wrenches. Second Head on rail and Right and Left-hand Side Heads quoted on request.

The arrangement for the belted motor drive as illustrated is so arranged that motor can be attached either by flexible coupling or by set of gearing. Flexible coupling and gearing are furnished at an extra cost.

You will note in our countershaft mounted on top of the housing of our planer, in addition to its very rigid construction with a separate pedestal extending to the floor, it has means for adjustment to tighten the belts as they stretch under strain, also means for adjusting countershaft in proper mesh with the motor gear. This feature we believe to be novel and substantially important. The shaft bearings are of ring oiling design.

The style motor and speed of same is left optional to the purchaser of the planer, as we furnish no electrical equipment, except when ordered, for which we can quote upon request.

The Bickett Machine & Mfg. Co.
Cincinnati, Ohio, U. S. A.

The Rockford Horizontal

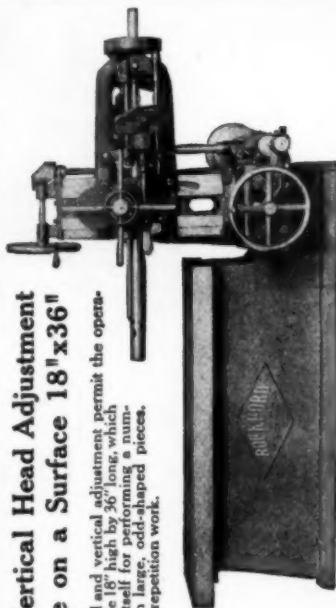
A Wide Range Drilling, Boring and Tapping Machine

With Lateral and Vertical Head Adjustment Operates Anywhere on a Surface 18" x 36"

The table is stationary. The lateral and vertical adjustment permit the operation of spindle anywhere on a surface 18" high by 36" long, which places this machine in a class by itself for performing a number of operations at one setting on large, odd-shaped pieces. It is particularly profitable on large repetition work.

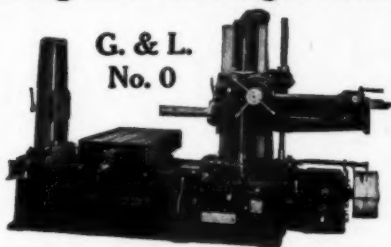
Combines delicate adjustment with great strength. Has the capacity for 2" high speed drills and for boring up to 6" or over according to feed used. Offers a choice of six driving combinations.

**A great economy tool
Better let us post you**



THE ROCKFORD DRILLING MACHINE CO., ROCKFORD, ILL.

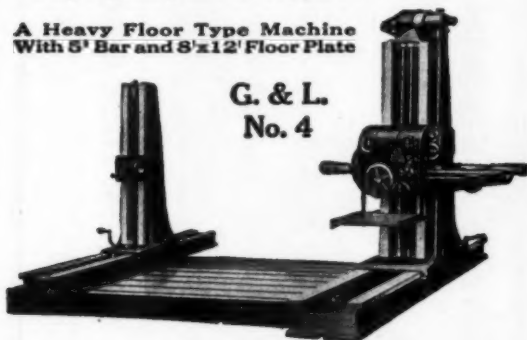
G. & L. Horizontal Boring Drilling and Milling Machines



**G. & L.
No. 0**

You will like the specifications of this rigid, self-contained tool, with direct drive, centralized control, superior accuracy and capacity, and great ease of operation.

**A Heavy Floor Type Machine
With 5' Bar and 8'x12' Floor Plate**



**G. & L.
No. 4**

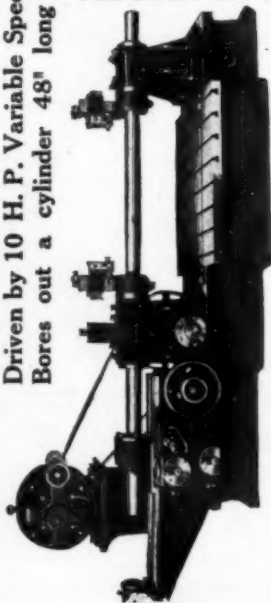
This giant tool makes easy work of such pieces whose shape and size make their handling impossible on an ordinary machine. With necessary fixtures, if work permits, it will machine five sides of a casting at one setting. The solid build eliminates vibration.

Let us send Circulars of these interesting economy tools

Giddings & Lewis Mfg. Co., Fond du Lac, Wis.

No. 2 "Barrett" Horizontal Cylinder Boring Mill

Driven by 10 H. P. Variable Speed 4 to 1 Motor
Bores out a cylinder 48" long at one setting



A great precision tool. The power is transmitted to boring bar by the Hindley type, worm and worm-wheel, double left-hand thread of powerful proportions, imparting a very smooth and even motion to the bar.

Bed, 13'1" long; widened portion, 48"x56"x18" high; boring bar, 5" diameter. Ten feeds are available.

A powerful precision tool you should know about. May we send complete data?

BARRETT MACHINE TOOL COMPANY, - - Meadville, Pa.

Builders of all sizes of Single and Double Bar Horizontal Cylinder Boring Machines for boring and facing simultaneously steam, gas, gasoline, pump and locomotive cylinders, also for boring the guides of engine frames and facing off end, besides boring and facing the crank shaft bearings simultaneously.

Think Of

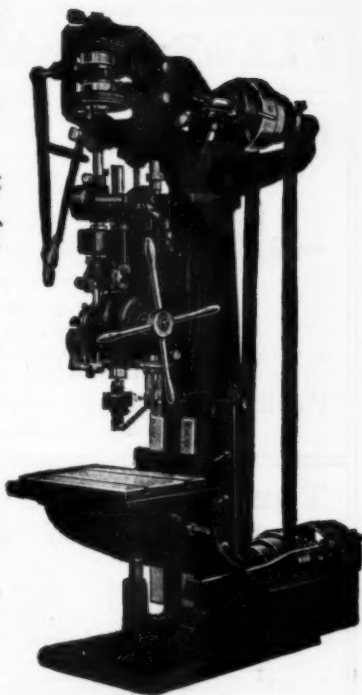
completing a series of operations at one setting of the work! That's the

Turner Turret

way. The rotation of this turret is automatic, so that when spindle is returned to its full height it automatically indexes to the next spindle.

Many Speeds

An extremely wide range of speeds is made available by means of minor gear changes; speeds may be different for each spindle, and all may be easily changed, to meet special conditions of stock or tools. A Turner Turret increases output, improves quality and reduces costs. Its adaptability is surprising—and it all means a greater, all round economy. Send for Bulletin FH and mail us a sketch of your work.



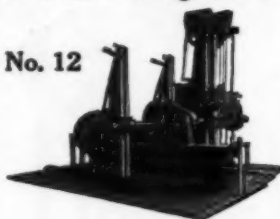
Builders of QUINT TURRET. Ask for Bulletin QH

TURNER TURRET

Turner Machine Company
DANBURY, CONN. and Newark, N. J.
Incorporated with Turner, Atherton & Co., Ltd.,
Denton, Manchester and Stockport, Eng.

P. & H. Drilling and Boring Machine

No. 12



1. Rapid traverse in each direction can readily be manipulated by slight adjustments on the hand wheel.

2. The spindle speeds are obtained by quick change gears and variable speed motor for either A. C. or D. C. current resulting in the following speed variations:

A. C. Current, 12 to 542 R. P. M.

D. C. Current, 10 to 445 R. P. M.

3. The four changes of feed available for each speed are made by the operator without leaving his position near front end of spindle.

Pawling & Harnischfeger Company

Milwaukee, Wisconsin

The LAMBERT—

Horizontal Boring Machine

As Accurate as
Human Skill can
Make it.

For
Boring
Milling
Drilling
Tapping



Extremely Simple
and Thoroughly
Efficient.

Start, stop or reverse
any feed with this lever

Start, stop or reverse
the bar with this lever.

The Lambert Machine & Engineering Company

Cleveland, Ohio, U. S. A.

Hammond High-Speed Sensitive Radial Drills

Minutes—even seconds count when you are doing light drilling and tapping. If your mechanics spend their time moving heavy parts each time they drill or tap a hole, they are cutting your production and profits.

With a "Hammond" they move the tool from place to place instantly—anywhere within a 48" circle. They move the tool and not the work. The operator's time is spent in production—not in doing laborer's work at mechanic's wages.



*Write and find out how you
can cut your light drilling
and tapping costs 25 to 33%*

The Hammond Mfg. Co.
Cleveland, Ohio



High Grade Ball Bearing Drilling Machines

With 1, 2, 3 and 4 Spindles

Write for descriptive circular

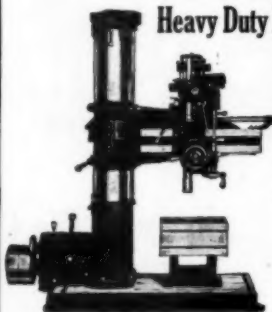
Francis Reed Co.

43 Hammond St.

Worcester, Mass.

It will be worth your while to carefully consider
these distinctive features of the

Heavy Duty Mueller Radial Drill



Patented Stationary Column.

Combination Positive and Friction Feed.

Effective, yet extremely simple control.

Combination Low and High speed reverse for backing out taps.

And many others which this space will not permit us to enumerate.

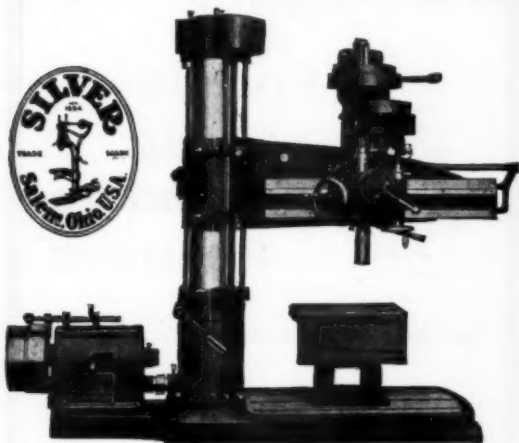
The Mueller Machine Tool Co.

Radial Drills and Lathes

Cincinnati, Ohio

ANNOUNCING SILVER RADIALS

After sixty-five years of successful drill manufacturing experience—four years of experimental work, exhaustive tests and investigation into the requirements and possibilities of radial drills, we are putting on the market the new Silver Radials. They incorporate many patentable features not found on other drills.



Built in 2½, 3 and 3½ foot sizes

Read announcement and description in October issue of Machinery, American Machinist, Iron Age, etc., and drop a line for attractive descriptive folder

The Silver Manufacturing Co.
Box 295, Salem, Ohio, U. S. A.

Founded 1854

LONDON PARIS BRUSSELS NEW YORK GENOA SIDNEY CAPE TOWN
Silver radials made by the builders of the famous Silver line of 20 and 25" drills

The Recognized Standard

**for all Factory or Outside
Work**

"Van Dorn"



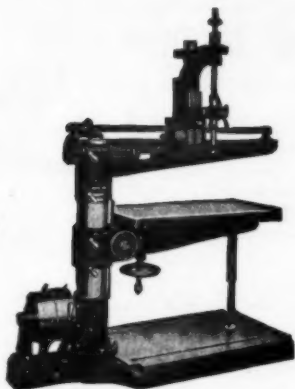
Portable Drills Grinders Reamers

Send for Catalogue HMT-19 today



**The Van Dorn
Electric Tool
Company**

**Cleveland, Ohio
U. S. A.**



This Taylor & Fenn 3-Foot Radial Drills Holes and Cuts Costs

If you have drilling to do up to $\frac{3}{4}$ in. in big, hard-to-handle pieces, this exceptionally handy machine can save you money. Its wide range and quick action, its convenience of adjustment, its dependable accuracy, and its low consumption of power all combine to make it a tool that lowers manufacturing costs.

We could not say beforehand just how much it would save on your work, but we do know that in some shops it has doubled and even trebled previous outputs.

*Ask us to mail you our production records
and cost comparisons—all interesting data*

The Taylor & Fenn Company
Hartford, Conn.

Minster Jr. Drill

Capable of Heavy Boring

A tool of simple and rugged construction, which is particularly profitable in large production shops.

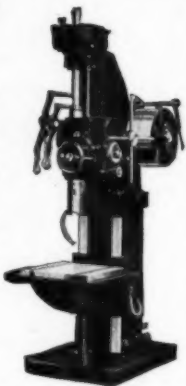
It has 6 speed and 4 feed changes, but any desired speeds and feeds may be obtained by changing gears. This, with its capacity for heavy boring, enables it to cover an unusual range of work.

The speed transmission gears run in a constant bath of oil. Ball bearings throughout insure quiet running. Tapping attachment, compound table and adjustable motor base if desired.

Write for Bulletin No. 30

MACHINE TOOL DEPT.

Minster Machine Co.
Minster, Ohio



For Cutting Costs---

"Demco" No. 40

Drilling, Milling and Tapping Machine

Has a reverse drilling capacity of $\frac{3}{8}$ " and tapping capacity of $\frac{5}{8}$ ". Has four back geared speeds, right or left. There is a cone friction clutch engagement for tapping and reversing. It is equipped with vertical drive shaft with bevel gears running in grease.

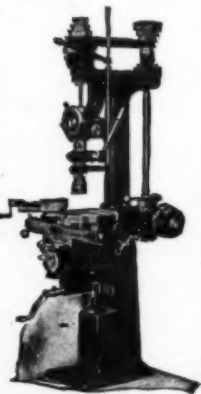
Its special adaptation is tool-room work, such as making dies, taps, jigs, etc.

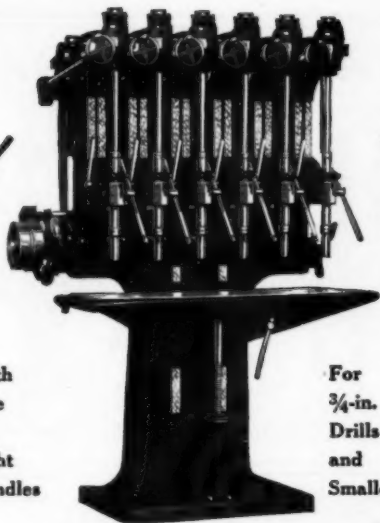
Why not write us now?

The Demco Machine Tool Co.

Successors to

The DeMooy Machine Co.
706 Frankfort St., N.W. Cleveland, O.





With
One
to
Eight
Spindles

For
 $\frac{3}{4}$ -in.
Drills
and
Smaller

There are from 2,000 to 3,000 Henry & Wright drilling spindles in use in one plant alone

The reason that so many shops, including some of the largest plants in the country, have standardized their drilling equipment with Henry & Wright's, is *because they "made good"* in exhaustive competitive tests. Write for description of their gearless power transmission with frictionless bearings and other H. & W. improvements for faster and better drilling, also for the free Speed and Feed Chart.

The Henry & Wright Mfg. Co.
760 Windsor St., Hartford, Conn.

OVER-SEAS REPRESENTATIVE

ALLIANCE **ALLIED MACHINERY COMPANY OF AMERICA** **ALLIANCE**
120 BROADWAY, NEW YORK, U.S.A.

Principal Foreign Offices: Paris, Turin, Zurich, Barcelona

THREE To ONE



A golden opportunity
to increase production
in your shop.

Sellew Adjustable

*** Drill Head ***

means the economy of
drilling three holes at a
time instead of one.

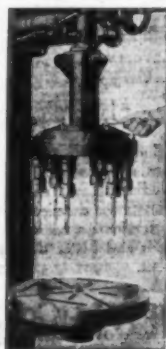
We also make Special
Drill Heads with fixed
spindles.

What do you think?



SELLEW MACHINE TOOL CO.,

Pawtucket,
Rhode Island



"Buhr" Drill Heads

Adjustable and Fixed Center

All-Ball-Bearing

Adjustable from 2 to 12
spindles.

Fixed center, any number
of spindles.

We guarantee our Heads
to stand up to capacity.

Nelson-Blanck Mfg. Company

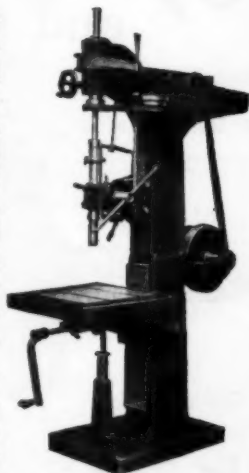
Detroit, Mich.

Avey No. 3

Heavy Duty Ball Bearing Drilling Machine

Designed for quantity and quality production on all classes of drilling. Much higher speeds can be obtained than ordinarily used for holes from $\frac{3}{4}$ in. to $1\frac{1}{8}$ in., combined with finer feeds, makes a production increase of from 25 to 50% possible.

Built in combinations of one to six spindles with plain hand or power feed. Ball bearings throughout.



Our No. 3 machine provides maximum speeds for work up to $1\frac{1}{8}$ ".

Write for Bulletin containing details

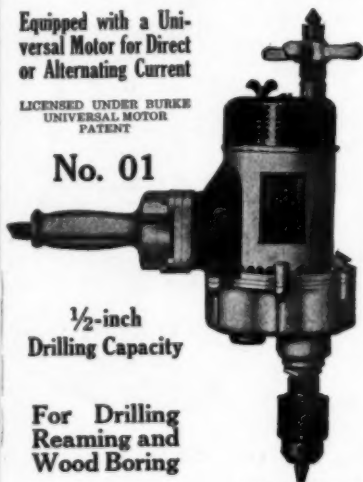
The Cincinnati Pulley Machinery Co.
Cincinnati, Ohio

Thor Portable Electric Tools, Drills and Grinders

Equipped with a Uni-
versal Motor for Direct
or Alternating Current

LICENSED UNDER BURKE
UNIVERSAL MOTOR
PATENT

No. 01



$\frac{1}{2}$ -inch
Drilling Capacity

For Drilling
Reaming and
Wood Boring

Send

for

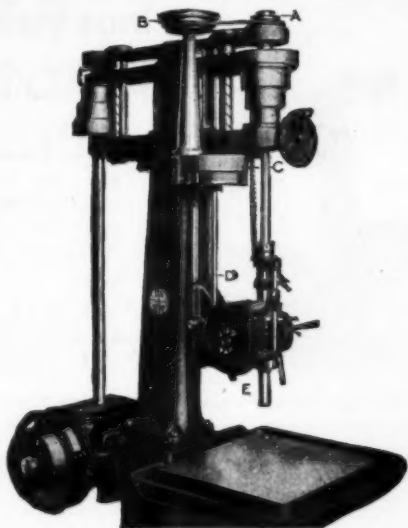
Circular

No. 29

Jacobs Chucks used as
regular equipment

**Independent Pneumatic
Tool Company**

Chicago New York Pittsburgh Cleveland Detroit
San Francisco Birmingham Montreal Toronto



66% Saving

A User of

The Sipp Drill with Power Feed

reports a saving of 66% over old-style drill he had been using. This difference was largely due to the *different* Sipp Power Feed. It is unique.

Write for details

The Sipp Machine Co.

Keen Street, Paterson, N. J.





Burke Quality Excels on Fine Points

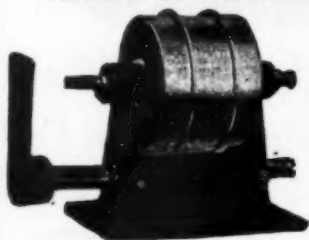
Machines of
Burke Quality
are never built
with any name
cast on the
frame but our
own—

**BURKE
CONNEAUT
U. S. A.**

For Sale Everywhere

Price, \$20.

Burke Tapping Machine Another Tool of Burke Quality



Pin Clutch Drive
 $\frac{1}{4}$ " capacity, \$20.

Friction Drive
 $\frac{3}{16}$ " capacity, \$20.
 $\frac{3}{8}$ " " 35.
 $\frac{1}{2}$ " " 50.

BUILT throughout with exceptional care, our several sizes give service in proportion. Accurate, rapid and convenient, they give solid satisfaction.

Send for details today

The Burke Machine Tool Co., Conneaut, Ohio

Model "E-50" Sensitive Bench Drill Press

This 2-speed, direct motor drive, high-speed ball bearing drill is especially designed to care for all work, ranging from the smallest to a $\frac{1}{4}$ " hole.

Can be furnished with special pulleys to drive main spindle any speed up to 10,000 R. P. M.

Main spindle is heat treated and ground to size; it is guided through a quill with support at each end in an annular ball bearing.

End thrust is taken up by an end thrust ball bearing under feed arm.

A quick adjustable table has a working surface $5\frac{1}{2}$ " x 5", and will take work up to $4\frac{3}{8}$ " in height.

Surface of table is ground to insure accuracy.

Table has a self-cleaning taper, which keeps the precisely ground main column free from chips, and serves also as a guard to prevent injury to column.

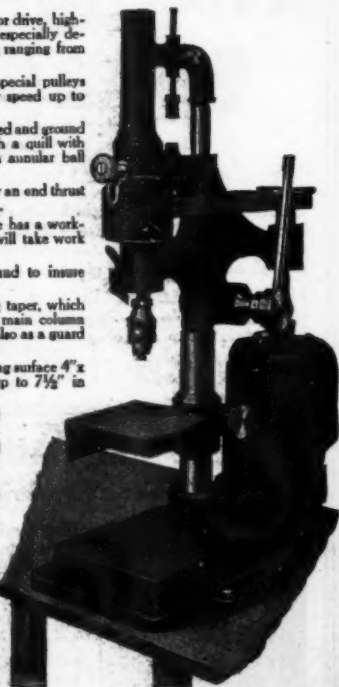
Base has a ground working surface 4" x 6", and will take work up to $7\frac{1}{2}$ " in height.

Base has oil groove and self-cleaning column support.

Your attention is called to another special feature, which is a spindle lock enabling quick changes of drills without the operator's hands coming in contact with belt or pulleys.

An idler pulley takes up any belt stretch which may occur in the endless woven canvas belt, without impairing sensitiveness of machine.

Front pulley and upper part of spindle are guarded by a semi-tubular guard insuring safety. Machine may be operated either by hand or foot control.

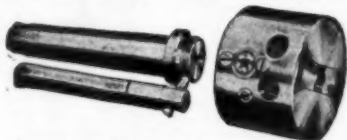


Height over all.....24"
Base..... $7\frac{1}{2}$ " x 18"
Diameter of spindle..... $7/16$ "

Spindle feed..... $7/8$ "
Weight.....62 lbs.
Will drill to center of a 6" circle

The High Speed Hammer Co., Inc.
Dept. 14
Rochester, N. Y.

A Tool You Need—



Flynn Combination Drill and Micrometer Boring Head

Unexcelled for use on horizontal boring or milling machines, in connection with jig and fixture or experimental work. By eliminating mistakes, this tool saves not only time but material as well, and also tends to give your shop greater efficiency.

Head runs concentric and has no projections to interfere in reaching small places. Adjustable to 1000's of an inch. Limit of drills, 0 to $\frac{3}{4}$ " ; boring bar, $\frac{3}{4}$ x5 $\frac{1}{2}$ ". *Write for details.*

J. M. WATERSTON, 78 Woodward Ave.
DETROIT, MICH.

Offset Drilling Attachment

A Size for Every Drill Press



They reach where nothing else can, and do efficient work. Made in standard forms, or modified on short notice to fit your needs.

We have been behind on orders, because automobile, traction, truck and aeroplane makers were taking them faster than we could make them. But we have enlarged this department and can now meet the demand.

Write for the illustrated Folder O. K.

The H. E. Harris Engineering Co.
Bridgeport, Conn.

Rickert-Shafer Friction Driven Tapping Machines



Vertical Tappers

Floor type only. Sizes, $\frac{1}{4}$ " and $\frac{1}{2}$ ". The spindle travels to and from the work. Equipped with SKF thrust bearings. All annular bearings are bronze.

Horizontal Tappers

Bench or floor type. Sizes, 3-16", 5-16" and $\frac{1}{2}$ ". Can be direct connected to motor.

Radial Tappers

Capacities of $\frac{1}{4}$ " and $\frac{1}{2}$ " in steel. Designed for maximum production in tapping automobile and machine tool parts with the least possible amount of handling.

Friction Drive

Under perfect control and highly efficient. The instantaneous reversing mechanism eliminates all shock to the tools and prevents breakage.

Write for our Tapping Machine Bulletin

which describes all types and sizes of these time-saving, tap-saving, practical, efficient machines.

Rickert-Shafer Company

1110 Cherry Street,

ERIE, PA.

Alert Boring and Facing Tool



High Speed Steel Blades

Made in Three Sizes

Holes 6 Inches Deep have been bored accurately in one cut. There's a reason. The Alert is used successfully on turret lathes, automatic screw machines and drill presses, for facing, counter-boring and radiusing where a fine finish is desired. Bore large holes where the cost of high-speed drills is prohibitive.

You Will Like our Ratchet Tap Wrenches, Roller Grip Arbors and Roller Grip Mandrels—all patented; also our High-Speed Solid Tap Wrenches and Hand Knurling Tool Holders.

Write for descriptive circular "H"

Alert Tool Co., 237 N. 6th St.
Philadelphia, Pa.

Kwick Kutting, Accurate Tools

Madison Cutters for any Size Holes



These cutters are made in 45 sizes—from 1¼ to 5" diameter. They cut, without grinding, any size hole, and are quickly adjustable to .00025 inch. You can depend on it that *every hole will be exactly the size you want.* Satisfied users: Continental Motor Corp., Cadillac Motor Co., et al.

You can get actual proof by experiment. Write to

MADISON MANUFACTURING CO., - Muskegon, Mich.
Tool Agents Wanted

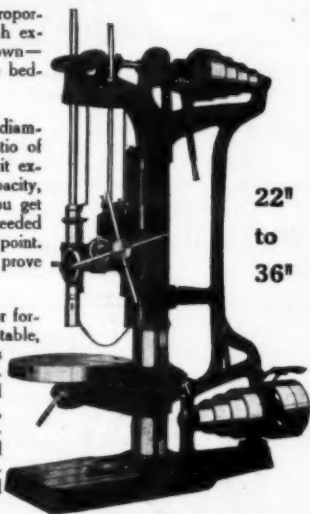
For Maximum Production

The Heavy Duty, High Speed "Aurora"

It's a sturdy, well proportioned machine with excellencies all its own—features that insure bed-rock economy.

The large pulley diameter and gearing ratio of the "Aurora" give it exceptional pulling capacity, and that means you get power where it's needed most—at the drill point. Production records prove our claims.

Should the operator forget to clamp the table, the large bearings will prevent its tilting. Worm wheel drops automatically, giving a positive release. Ample metal thruout gives the machine the desired rigidity.



22"

to

36"

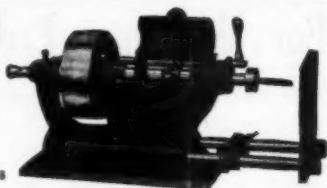
A low overhead, in combination with modern manufacturing methods, enable us to make attractive prices, quality considered. Write us for full information.

The Aurora Tool Works

Aurora, Indiana, U. S. A.

Workwell Tapping Machine

Built for Service
Has Many Fine Points



2 bar slide to hold work straight with tap.

Steel gears 2" diameter, enclosed and running in oil.

Extra large hardened clutch. One loose pulley with hardened clutch. Non-slip tap holders. Die holder for threading outside threads. Stop adjustment for any depth of thread.

MADE IN TWO SIZES.

Type B 2 for threads to $\frac{1}{4}$ " diameter Type C 2 for threads to $\frac{1}{2}$ " diameter

Give it a trial. Manufactured by

Workwell Engineering & Mfg. Co.

Dept. 2

616-620 W. Monroe St., Chicago, Ill.



Don't Break 90 Per Cent Of Your Taps

It is estimated that 90% of all taps break before they are worn out. Often in difficult jobs, such as blind and bottom tapping in shallow holes, a tap breaks before you can work the stop on the machine. This waste is needless, however, and may be positively eliminated by using

The Woodstock Improved No-Tap-Breakage Chuck

It automatically releases tap the minute it binds or touches bottom. Utilizes 95% of tap without breaking it.

Used by U. S. Armies. For details, write to

Peter Bros. Mfg. Co.

115 Railroad St., Algonquin, Ill.

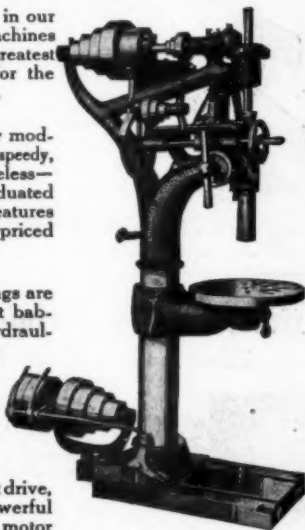
Latest Improved 20-Inch
Canedy-Otto Power Drills
With Capacity for 1½" Holes

We believe that in our 20" Drilling Machines we give the greatest possible value for the amount invested.

They are strictly modern tools—simple, speedy, accurate and noiseless—with all the graduated and automatic features found in high-priced drills.

The large bearings are made of the best bab-bitt metal, with hydraulically pressed sheet graphite cones, which increase their life 300 to 400 per cent.

Furnished for belt drive, or with a powerful direct-connected motor with all-spur-gear drive, also with our improved tapping attachment if desired.



It's too good to be overlooked. Write for complete data.

Canedy-Otto Mfg. Company
Chicago Heights, Ill.

Manufacturers of Forges, Blowers, Drills, Lathes and Grinders

Inventory Is Coming Soon

Better Get Ready to Clean House Right



Pipe, Shafting and Bars

are about the worst things to get mixed up or scattered around, often in the way, and you simply can't clean house right unless you have the

"Handiest Racks"

They store your bar stock in a fourth the space, where you can see what you have, where you can keep it assorted and counted, and where you can get at it easily and quickly.

*Better get in touch with us NOW,
and be prepared in ample time
to change that mess into tidy stock
at house-cleaning time.*

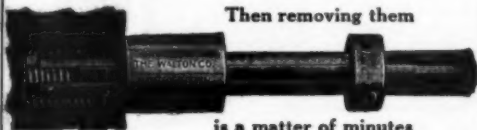
Wm. S. Yohe Supply Co.

503 Mahoning Road, N. E.,

Canton, Ohio

Broken Taps are Time Wasters

Unless You Have a Walton Extractor



Then removing them

is a matter of minutes

These extractors save so much puttering that they pay for themselves over and over again, and as taps are sure to break—it is estimated that 90% do break—it is economy to have them ready for instant use.

Sizes from No. 8 to 1 1/4"

Let us describe or quote

THE WALTON CO., Hartford, Conn.

You will like and profit by the superior features of the EDLUND

A Gilt Plate

on a machine may add to its appearance, but does not aid production. The Edlund high speed sensitive drilling machine embodies practical features which help to keep shop costs down. The

Straight Endless Belt

eliminates entirely the objectionable features of the quarter turn belt. The feed pinion bearing is extra long, and the sliding arm is extra large. There are

Ball Bearings Thruout

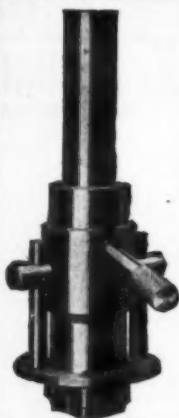
which gives it that smoothness of operation which makes accurate work a matter of course. Ten ball bearings are used on each spindle, and a small reservoir at the top of spindle sleeve provides perfect lubrication without frequent oiling. Large cone and drive pulleys give the Edlund unusual power.



You will be interested in the complete specifications. Send us your address today

Edlund Machinery Company, Inc.

250-300 Huntington Ave., Cortland, N. Y., U. S. A.



Murchey Collapsing Taps Eliminate Danger Of Injuring Threads

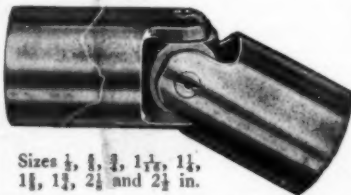
These patent Automatic Collapsing Taps do not strip or injure the threads. They do not need to be backed out, which operation takes as long as it does to thread the work. They increase efficiency and make a saving of from 50% to 75% in tapping costs.

Adapted for all styles of machines and every kind of work—any size from 1" to 12". Made in two types—the Lever Handle and the Sliding Head Types. They have no weak parts. Are adjustable for wear and tight and loose threads.

*Let us show you why they excel
Just drop us a line*

Murchey Machine & Tool Co.
58 Porter Street, Detroit, Mich.

Self-Oiling, Dirt-Proof "Giant" Universal Joint for Heavy Duty



Efficient to an
angle of 45
Degrees

Vanderbeek
Universal
Ball Joints
for higher
angle drives

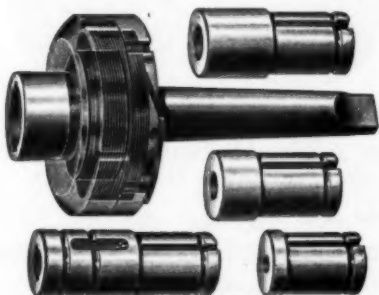
Sizes $\frac{1}{2}$, $\frac{3}{4}$, 1, 1 $\frac{1}{8}$, 1 $\frac{1}{2}$,
1 $\frac{3}{4}$, 2, 2 $\frac{1}{2}$ and 3 in.

Wearing contacts are of hardened steel, the stem ends are strong and well braced, and the whole design is so strong and carefully constructed that it will safely drive well over its rated capacity. *Glad to have you try it out.*

Ainslie Machine & Tool Works
Successors to Vanderbeek Tool Works
HARTFORD, CONN.

The Safety Friction Driven Drill and Tap Holder

Saves Time, Tools and Temper



The Four Sizes Cover 0 to 2½ in. diameter

This power driven holder permits tapping to the bottom at full speed without danger of breaking anything, for when the tap is subjected to any undue strain it stops before reaching the breaking point while the spindle revolves. This saves time, taps and temper.

There is nothing about it to break or get out of order. It is unequalled for simplicity, rapidity, economy and accuracy, and it is giving splendid satisfaction wherever used. Change is made from drill to tap, or tap to drill, without stopping the spindle.

Try it out on your most difficult work

The Beaman & Smith Co.
Providence, Rhode Island

Abbott Steel Bearing Balls

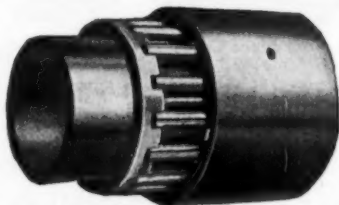
High Grade—Highly Finished



We shall be glad to have your inquiries and make estimates

The Abbott Ball Company

Elmwood District, Hartford, Conn.



JOURNAL ROLLER BEARINGS

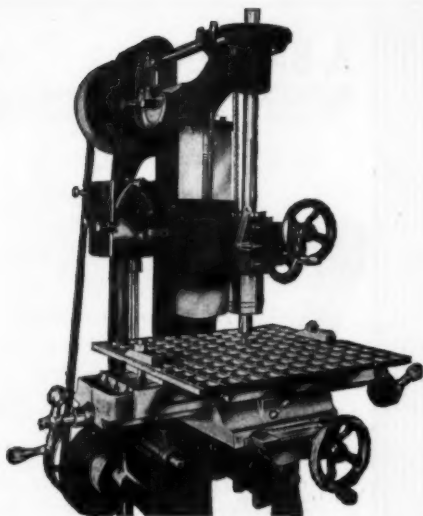
LIGHT DUTY

HEAVY DUTY

ONE OR ONE THOUSAND

THE GWILLIAM COMPANY

253 WEST 58th ST., (at Broadway), NEW YORK



Do Your Hard Machining

With Knight Milling and Drilling Machines

A Brockton, Mass., firm had a very difficult piece of machining to do (the mould shown in cut), and gray hair and worry wrinkles seemed to be in store for friend foreman, when the job was put on a Knight and all anxieties faded away.

Knights not only reduce worries—they also reduce costs. They are thoroughly modern machines of remarkable convenience. Set the job and you can mill, bore, and drill at practically any angle. Your choice of three sizes—large, medium and small. Let us tell you more about them.

W. B. Knight Machinery Co.

3920 W. Pine St., St. Louis, Mo.

A BARKER WRENCHLESS CHUCK

IN YOUR SHOP—

MEANS increased production—
because it operates simulta-
neously and centers automatically.

Whether revolving or still--the BARKER
WRENCHLESS CHUCK saves all the
time heretofore *wasted* in wrenching and
adjusting. Add this to your production.

Just pull lever and the piece is Chucked.

Sizes 6 to 16 inches—2 and 3 jaws.

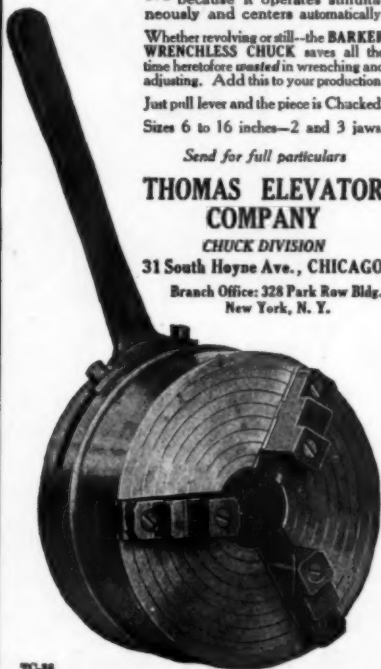
Send for full particulars

**THOMAS ELEVATOR
COMPANY**

CHUCK DIVISION

31 South Hoyne Ave., CHICAGO

Branch Office: 328 Park Row Bldg.
New York, N. Y.



TC-38

Jacobs Chucks

This Company applies every facility and ability to the end of forecasting and properly filling the needs of patrons. Strict attention to service—both in quality of output and adequacy of supply—are proudly assured.



The Jacobs Mfg. Co.
Hartford ~ Connecticut.

Eclipse Self - Tightening Drill Chuck



Roller bearing.

Quickest and easiest grip, and it never slips.

Self-tightening. No keys or wrenches.

It has no rival in its combination of quick and firm gripping, easy release, simplicity and accuracy.

Saves time and money on high speed drills.

You need it now. Why wait?

Nielsen-Barton Chuck Co., 106 S. Jefferson St.
CHICAGO, ILL.

Also makers of ARBORS for all kinds of Chucks

YOUNG, CORLEY & DOLAN, Inc., 115 Broadway, NEW YORK CITY
New York District Agents

The Test of Time

**"CUSHMAN"
CHUCKS
1862**



**LATHE CHUCKS DRILL CHUCKS
FACE PLATE JAWS**

**Three Generations of Skilled Mechanics
have made them and have used them**

**THE CUSHMAN CHUCK CO. HARTFORD,
CONN. U.S.A.**

"Reconstruction"

The greatest problem of the American manufacturer today is to so increase his output and reduce his production cost that he is thereby enabled to keep his plant fully at work, regardless of external conditions.



solve this problem wherever rapid machining or reaming is required.

Let us tell you about

McCrosky Wizard Chucks and Collets

for the drill press

McCrosky Turrets

for your old engine lathes

McCrosky Adjustable Reamers

for every reamer operation.

Fully described in Catalog No. 6

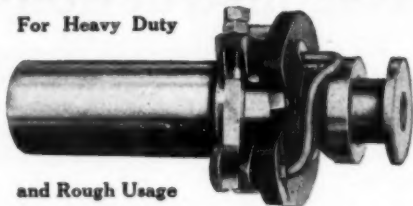
"A text book on modern machine-shop methods"

McCrosky Tool Corporation

Meadville, Pennsylvania, U. S. A.

CONWAY COMPRESSION SLEEVE CLUTCH

For Heavy Duty



and Rough Usage

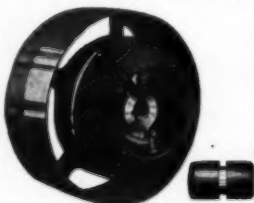
The Sleeve Clutch affords a real economy because you can place the clutch with sleeve on the line shaft and drive direct to the machine. This affords a real saving in floor space, belting and countershafting. The sleeve is standard, and fits any size pulley—wood, steel or cast iron—sprocket or gear.

Our Compression Sleeve is simple in construction, and has a fool-proof adjustment. Our line of Clutches is complete and has stood the "gaff" for over 20 years. ***We solicit a trial order.***

CONWAY & COMPANY, STOCK YARDS P. O. CINCINNATI, O.

"Edgemonts" To Fit Any Condition

We Are Friction Clutch Specialists



Enclosed Type, Self-Oiling

There is an "Edgemont" to fit your requirements, whatever they are. These clutches have been used for years by the leading machine tool builders. Write for names.

"Edgemonts" are powerful and neat, operate easily and quietly, and release instantly. They are guaranteed to pull all a belt will at any speed. They stand up under use and abuse in long, continuous service.

Write for Catalog of "The Clutch that's stood the test"

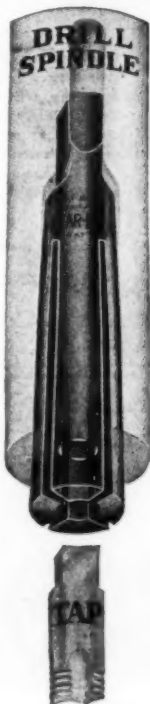
The Edgemont Machine Co.
Dayton, Ohio

Special Clutches and Transmission Machinery for all purposes.

Tapping for Dollars

WITH

"Wear-Ever" Tap Chucks



Save time and money by eliminating approximately 90% of your tap breakage. "Wear-Ever" Tap Chucks will do this because they hold the tap and drive it true regardless of variation in the size of shanks.

They fit any tap made to the standard adopted by the Associated Tap Manufacturers. The chucks are used as sockets and adjust themselves.

Despite their efficiency, they are very low in price. They are such a valuable asset that you should not hesitate to invest in such profitable tools.

We especially urge you to send in a trial order. Then you may test the chucks yourself. And why not NOW?

Scully-Jones & Company

Suite 555 Railway Exchange Bldg.,

Chicago, Illinois

A Factor in Economy

Sweetland Lathe Chucks



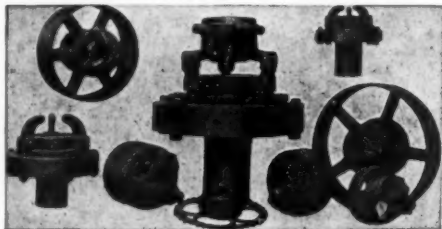
Grip quickly, which means low time costs. Grip securely, which means safety to operator as well as to material. Grip all kinds of shapes easily and accurately.

When you write ask for Catalog 11-C

The Hoggson & Pettis Mfg. Co.

New Haven, Conn., U. S. A.

**Refer your clutch problems to us
Solving them is our business**



*Special Clutches — a specialty
Catalogue cheerfully sent on request.*

National Clutch Company

1859 Fulton St.,

Chicago, Ill.

10"x30" Webster & Perks
Universal Cylindrical Grinder
A Heavy Duty Machine of Extreme Accuracy



A rigid, rugged, completely universal machine for both quality and quantity production, with many exceptional features suggested by our experience of 25 years in building grinders of the better class.

The automatic cross feed, table drive and reversing mechanism are positive and dependable, providing a positive means of feeding wheel to work and of stopping feed at any predetermined point. The automatic cross feed is adjustable for feeding from .00025" to .004" by simply turning a small knurled nut.

The internal grinding attachment, counter bracket and dead center pulley are equipped with ball bearings, with nine Hyatt roller bearings in the countershaft, insuring smooth action, low power consumption and long wear.

*These are only hints of its general excellence
We shall be pleased to mail you complete specifications*

The Webster & Perks Tool Co.
Box 1340, Springfield, Ohio, U. S. A.

Accuracy and Precision

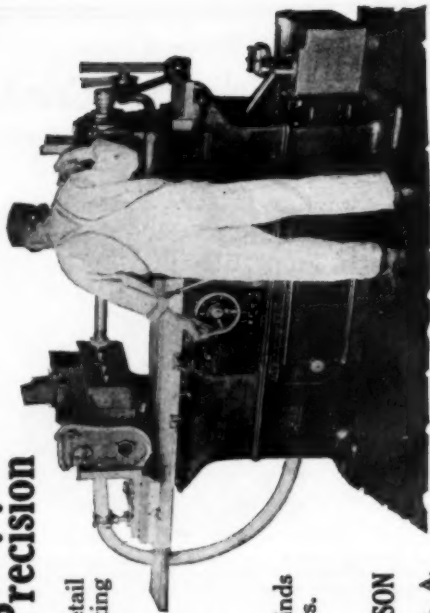
are followed out to the last detail
in the construction and testing
of the

Whitney Cylinder Grinder

equipped for grinding all kinds
of Gasoline Engine Cylinders.

Write for new catalog

BAXTER D. WHITNEY & SON
Incorporated
WINCHENDON, MASS., U. S. A.



***"Sharp Tools
Defeat Sharp
Competition"***



**New No. 190
"WELLS"
GRINDER**

will do everything that
many more expensive
machines will do.

See it on your dealer's
floor or write for Ma-
chine Tool Cata-
log No. 39.

Machine Tool Division



GREENFIELD TAP & DIE
Greenfield, CORPORATION Mass.

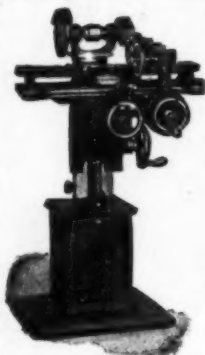
Ott Grinders

Combine the essentials of
ACCURACY and **RIGIDITY**
with **SIMPLICITY** of design

Simplicity accounts for their price, and for
their popularity among good operators.

5"x18" Plain—10"x32" Universal—6"x6" Internal

Ott Grinder Company
200 West Tenth St., Indianapolis, Ind.



YOU CAN DEPEND ON THE
Speed, Accuracy and Rigidity
of the

STERLING

**UNIVERSAL TOOL
GRINDER**

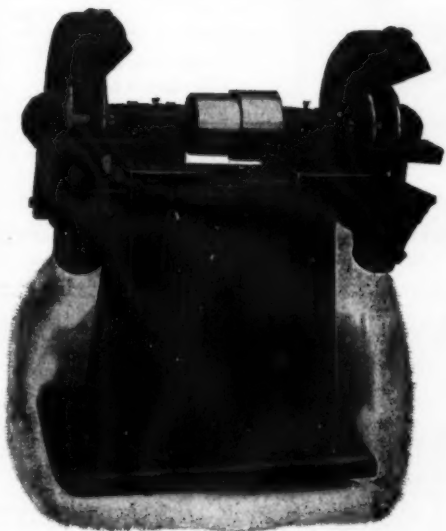
for efficient service in your tool
room just as we depend on this Grinder
in maintaining our reputation as
builders of high grade, depend-
able machinery since 1874.

OUR CATALOG

*Tells the "Why" of Sterling
grinder construction*

McDONOUGH MFG. COMPANY, Machine Tool
Eau Claire, Wisconsin Department

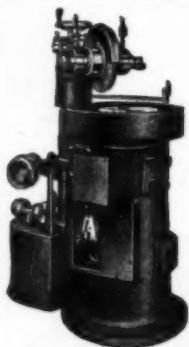
Grind it on a "Blount"



No. 6½

Our eight sizes meet all requirements of general grinding work. The large bearings insure accurate work under continuous heavy load.

J. G. BLOUNT CO., Everett, Mass.



Curved Surfaces

**Ground Accurately
To Within .00025"**

For grinding flat, convex and concave surfaces to the closest accuracy, you can find nothing better than the—

**12" Bristol Rotary
Precision Grinder**

It is unsurpassed in its combination of ease of manipulation, economy of operation, and accuracy of results.

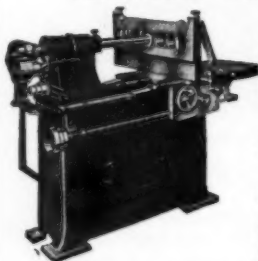
Complete information at your service

Bristol Machine Tool Co., Bristol, Conn.

Successors to The C. G. Garrigus Machine Co.

Internal Grinder of Supreme Merit

The "Schmidt"—Rapid and Exact



It regrinds tractor, truck, and engine cylinders—in fact, it does any grinding within its capacity—at a high rate of speed and with absolute accuracy.

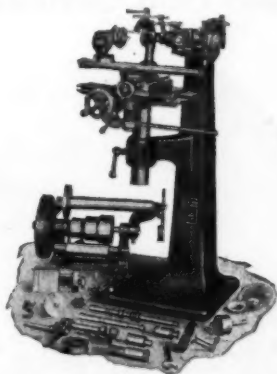
It occupies only 3'x5' floor space. It is easily handled and operates at minimum cost.

Emery wheel arbor is made of vanadium steel. There is a ball-bearing rocker arm countershaft and ball-bearing in rear end of emery wheel spindle.

For production as well as precision. Details gladly sent.

B. L. Schmidt Co., Dept. A 8, Davenport, Ia.

Speed Up Production By Using Thompson Universal Cutter and Tool Grinder



The Thompson Universal Cutter and Tool Grinder will enable you more frequently to grind your cutters and tools, making them wear longer and turn out more and better work.

It reduces to minimum the time required for any grinding jobs, and is *easily and economically operated*. It is quickly changed from one adjustment to another, is very rigid, and takes up an exceedingly small amount of floor space.

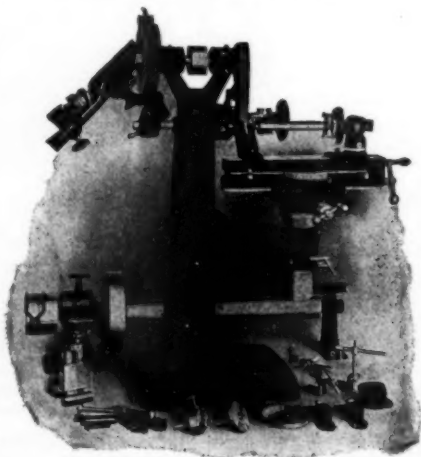
It is *universal in its scope*: it does cylindrical, surface and internal grinding; concave and convex grinding, and the many other grinding requirements of the present-day tool room and machine shop.

Bulletin C-3 shows some interesting figures. Write to

The Thompson Grinder Co.
Springfield, Ohio

W & M No. "O"

Universal Cutter, Reamer and Drill Grinder



Longitudinal Movement.....12 Inches
 Vertical Movement.....6 Inches
 Transverse Movement.....6 Inches

Centers swing work 8x17 inches

Circular on request

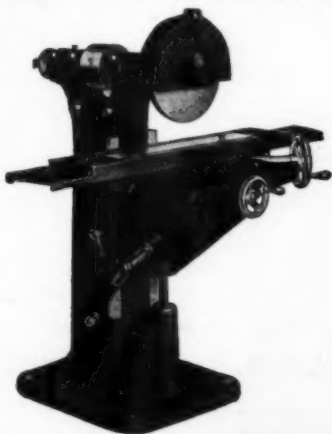
Wilmarth & Morman Co.

Master Grinder Makers

1185 Monroe Ave., N. W., Grand Rapids, Mich., U. S. A.

La Salle No. 3

**A Large, Accurate, Plain and Surface
Grinder for both Shop and Tool Room**



Nothing has been spared to build the utmost of service into the La Salle No. 3. It is designed for convenience, accuracy and production, and in its construction is as near mechanical perfection as human skill can make it. The materials are the best that can be found. Every bearing is fully protected and has large oil reservoir and felt oilers. All ways are hand-scraped to master plates.

Write for complete description of this serviceable machine

La Salle Tool Company

La Salle, Ill., U. S. A.

And ask about American Drill Grinders—also splendid tools

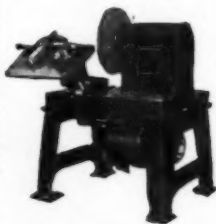
Changes Jobs In 30 Seconds

Fenn No. 1 Portable Gear Cutter Grinder

A big time-saver. It has attached to the top of the table a very effective stop finger which is so regulated by means of two adjusting screws that only thirty seconds is required to change from grinding a 40 pitch cutter to a 3 pitch cutter.

It can be quickly and easily carried to any bench in the shop and instantly attached to any lamp socket. Unexcelled for grinding gear and milling cutters, cutting brass tubing, etc.

Full details gladly mailed



Fenn Manufacturing Company Hartford, Conn.

W. A. FENN

W. L. FENN

Cable Address "Fenn"—Western Union Code

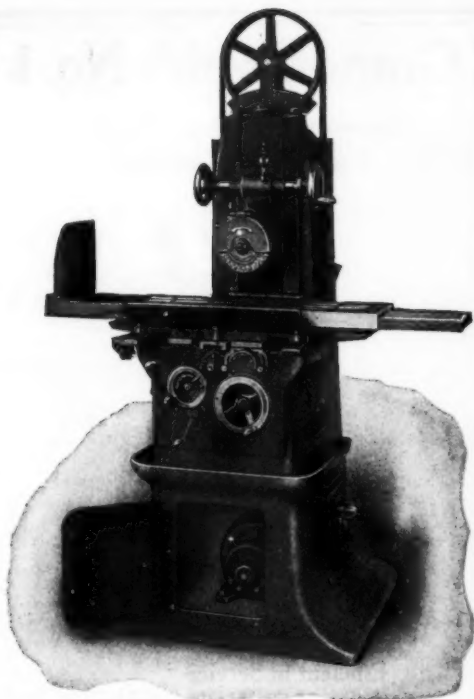
Harris No. 4 Universal Automatic Hob Grinder



Especially designed for the rapid and accurate grinding of hobs and form cutters, it is also valuable for re-gashing worn milling cutters and grinding work of square and octagonal shapes. Grinds on both forward and return stroke. Can be handled by inexperienced help. Automatic indexing device makes it possible for one operator to attend to several machines or do other work.

Write for Folder H. K., which explains fully

The H. E. Harris Engineering Co. Bridgeport, Conn.



It's 50% Heavier

The Abrasive Tool Room Surface Grinder

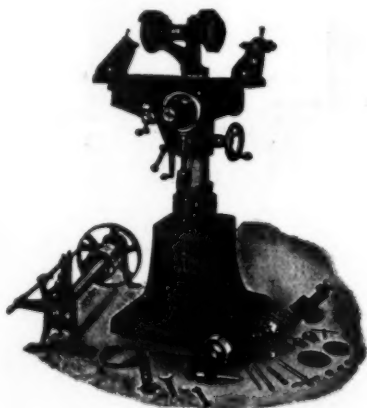
It is 50 per cent heavier than any other machine of its type, to permit of the greater grinding capacity that is built into it. The specifications tell the story. May we send them?

Abrasive Machine Tool Co.

East Providence, R. I.

Grand Rapids No. 1

Universal Cutter, Reamer
and Tool Grinder



Simple in Design
Efficient in Service
Accurate in Workmanship
Economical in Cost

Ask for bulletin giving full particulars

Grand Rapids Grinding Machine Co.

17 Ottawa Ave., N. W.
Grand Rapids, Michigan, U. S. A.

Greenfield

No. 1 Plain Grinder

A Wonder on Small Work



Within the
reach of
every shop
and good
enough for
the best

The Small Grinder with the Rapid Cut

Here are a few simple facts—(1) You can finish small cylindrical parts the most accurately and economically by grinding; (2) the Greenfield No. 1 costs several hundred dollars less than the big grinders commonly used; and (3) a simple and effective hydraulic table feed permits two to three times as rapid cuts as on larger grinders, easily making up in speed for its lighter cuts. It is simple, handy and highly efficient.

Send sketches or sample parts for cost estimate

Greenfield Machine Company
Greenfield, Mass., U. S. A.

Also Manufacturers of the Greenfield Universal Grinder



THERE'S a toolmaking shop in Detroit that refused to be stumped by any of the many problems our motor car builders present—the Michigan Tool Company.

This concern is fully equipped for any job—which means Dumore Grinders are there to do their bit.

In building jigs, standard bushings are used, the outer diameters running in an ascending series of sizes and calling for an arbitrary "constant" for the press-fit.

For grinding of this kind the Dumore is the ideal tool—high speed, dynamically balanced, non-vibrating, easy to move out of the way to permit the various holes to be indicated. *Write for information.*

WISCONSIN ELECTRIC CO.

4317 Sixteenth St., Racine, Wisconsin

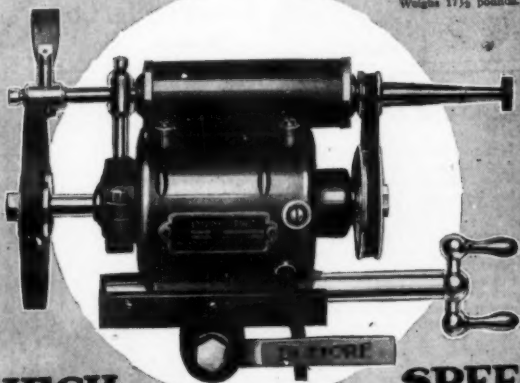


DUMORE CO.

Making Accuracy A Marketable Commodity

EQUIPMENT A

For general tool room use.
Includes High Speed In-
ternal Spindle A with reach
of 3 inches. 30,000 R.P.M.
Comes fully equipped.
Weights 17½ pounds.



**HIGH SPEED
GRINDERS**



Ring Oiling Babbitted Bearings

For wheels up to 14"x2 3/4"x1 1/2"

This 14" Modern Grinding Machine is designed to give service. Its proportions insure an absence of vibration as it is of sturdy construction thruout. Its use varies from lightest tool work to a fairly heavy class of shop or foundry grinding.

*Write for more complete
description and price*

Carroll Mfg. Co.
Batavia, Ohio

Cut Your Grinding Costs

Not only in initial outlay but in general shop grinding practice. The **National** is the easiest to set up, will do anything any other grinder will do and many things no other grinder can do. Can be used for external or internal grinding (motor never in the way) on lathe, shaper, milling machine or planer. Unexcelled for grinding Cutters, Arbors, Reamers, Mandrels, etc., between centers, on small or large lathes. SKF ball bearings thruout.

The **National** is the grinder you have been waiting for. Send for circular and full details. Sent on 10 days' trial.



National Machine Tool Co.
Racine, Wisconsin

**The Largest Measure of
Economy and Safety
With Marschke Motor Driven Grinders**



**Direct Current
"Economy" Grinder
110 or 220 Volt
(See Illustration)**

Motor, 2 h. p.
Emery wheel, 12"x1½" or 2".
Emery wheel collars 5½"x1".
Length of arbor, 26".
Arbor where wheel goes, 1" diameter.
Center of arbor to floor, 39".
Base on floor, 20"x23".
Speed full load, 1,600 r. p. m.
Motor entirely enclosed.
Journal self-aligning S.K.F.b.b.
Automatic oil switch and starter.
Exhaust fan, 6"x2".
Exhaust fan bearing, S.K.F.b.b.

(Also made for
Alternating Current)

To install it is the easiest thing in the world—you place the machine on the floor, connect 2 or 3 wires, and you're ready for business. It is simple and efficient in every way, affording bedrock economy.

Among its features are a foot pedal, which is fool proof and a big time saver; adjustable cast steel hood and adjustable steady rest; spark breaker to take up space in hood as wheel wears down, which adjusts automatically with steady rest; removable hood cover, with single thumbscrew; an efficient exhaust fan which starts with motor—no separate exhaust system necessary, etc.

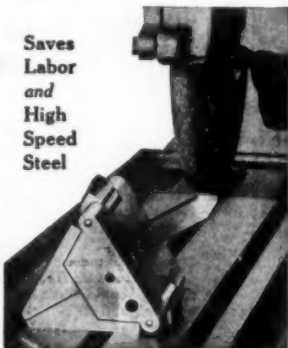
*It will pay you to get acquainted with these
ahead-of-date Grinders. Write for full data*

**Marschke Manufacturing Co.
Indianapolis, Ind.**

Quick Grinding with a Boss Jig

It has no equal for holding thread cutting tools while grinding 29 degrees acme, or 60 degrees U. S. Standard, or any degree between 29 and 60

**Saves
Labor
and
High
Speed
Steel**



The slotted screw in center of face controls the various angles required by turning, which causes the hinged wings to move in and out.

Clearance on thread tool is automatically provided for as the hinged wings are offset the correct degree to produce clearance.

Has containers for 3/8" and 5/16" tools; also furnished in special sizes.

The thread tool is accurately ground on both sides and top without removing from the Jig.

Retail price \$15.00, delivered anywhere in the United States. We shall be glad to quote terms to jobbers upon request.

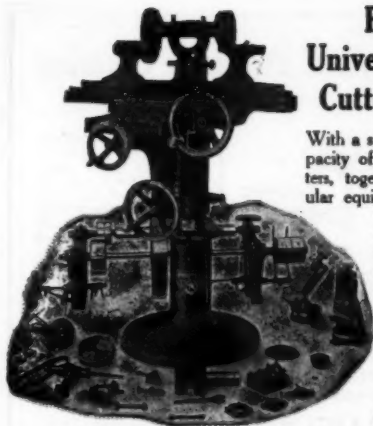


We solicit a trial order now—you'll order more later

G-L Sales Company

Sole Distributors

521-523 W. 26th St., New York City



Premier Universal Tool and Cutter Grinder

With a swing of 8" and capacity of 15" between centers, together with the regular equipment furnished, it will grind almost any cutter or other tool used in a modern tool room. Workmanship, material and design of the highest quality.

*Write for descriptive
Circular*

Immediate Delivery

Simmons 10" Universal Index Centers



Manufactured with the idea of supplying the market with a device in which accuracy, durability and simplicity are the main issues and in which no one feature is sacrificed for another.

The price is the lowest consistent in keeping with the above standards. Our production is such that immediate delivery can be made.

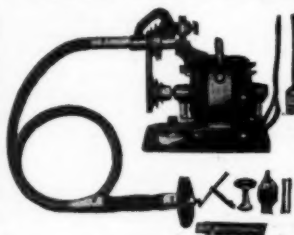
You need one? Order now!

Simmons Machine Co., Inc., Albany, N. Y.

New York, 1001 Singer Bldg. Detroit, 804 Dime Savings Bank Bldg
Buffalo, 358 Ellicott Square

The "Strand" Portable Grinder

Equipped with Anti-Friction Flexible Shaft



An ideal combination.
The Strand shafting is the most flexible made. It has all the strength and durability of the rigid shaft and is sufficiently tough and flexible to carry a load while in a curved position. Friction is reduced to an absolute minimum.

The "Strand" will save time and money wherever it is used. All Strand products are fully guaranteed.

Our several types and sizes are the result of 15 years' practical experience. Write for Circulars

N. A. STRAND & CO., 625 W. Jackson Blvd.,
Dept. H, CHICAGO

Saves Moving Castings

Stow Flexible Shaft is Easily Carried



HANDY, not only for grinding castings, but for a hundred-and-one odd jobs of grinding, drilling, tapping, reaming, polishing, etc. Hurries up repair jobs. Write for illustrated circulars.

Stow Flexible Shaft Company
26th & Callowhill Sts., Philadelphia, Pa.



Badger Grinding Discs

How Long Do Your Abrasive Discs Last?

If you are satisfied with 5 or 10 hours grinding from an abrasive disc you will not be interested in Badger grinding discs, but if you are looking for an abrasive facing which eliminates shutting down your disc grinder several times a day, an investigation of Badger grinding discs would be profitable.

Answer these questions as applied to the discs you are now using:

1. Does there seem to be sufficient abrasive grains on the cloth backing?
2. Are the grains of uniform size?
3. Do they appear sharp and pointed?
4. Is there an excess amount of glue?
5. Does the face of the disc feel sticky?
6. Is the disc limp and pliable?
7. Does the abrasive disc crack easily?
8. Does it show a tendency to warp and curl?
9. Are the outside diameter and hole trimmed true to size?
10. Is the cloth backing thick and tough?

These are some of the problems in the construction of an up-to-the-minute abrasive disc which must receive consideration if you would hope to obtain maximum value from this material.

Our 15 years' experience, not only in building disc grinding machines but in the practical application of abrasive discs, put us in position to render expert advice on this subject. If you would have your disc grinder do all that is claimed for it, supply it with the most effective abrasive discs obtainable.

We have incorporated a number of new and exclusive features in our discs, the practical results from which are astonishing. A trial order for Badger grinding discs may show you for the first time of what your disc grinding machines are capable.

Ask for our catalog showing disc grinders, lever feed tables, ring wheel chucks, abrasive discs and disc wheel cement

Badger Tool Company

E. B. Gardner, Pres. "Disc Grinder Service" R. D. Gardner, Treas.

Beloit, Wisconsin, U. S. A.

Representatives in all principal cities and foreign countries

Redface Pulleys



Sheaves and Fly Wheels



PERMANENT: They are permanent, as they are not affected by age, heat, cold or moisture.

RELIABLE: They do not loosen up under vibration or intermittent loading.

RUN TRUE: They run true, steady the line shaft, and have a very small load due to windage.

REDFACE PULLEYS are especially adapted to use on motors, fans, pumps and special machinery.

Catalog mailed promptly upon request

Pyott Foundry Co.

Cast Iron Pulleys, Sheaves and Fly Wheels
328 N. Sangamon St., Chicago, Ill.

George A. Lewthwaite

Time Tested Punches and Dies



For
Iron Workers
Ship Builders
Boiler Makers
Metal Lathers
Metal Bed Mfrs.
Sheet Iron Workers
Etc., Etc.

Try them out—that's all

Lewthwaite Shear and Rod Cutter

This
ient and
find it just
your shop, for it
easily shearing and
beyond its rated capacity.
earn its cost in a compara-
tively short time.

handy tool is compact, conven-
easy to operate. You will
right for many jobs in
has power to do
cutting even
It will



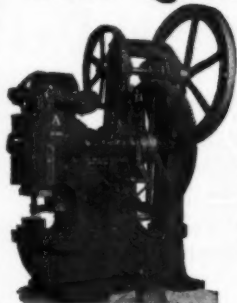
Also

Pipe Benders
Bar Benders
Power Presses
Foot Presses
Etc., Etc.

Get our Catalog of Iron-Workers' Tools for handy reference

George A. Lewthwaite Co.
116 Walker St., - - New York

"The Quality Line"



Power Punches and Shears

Over 60 years' manufacturing experience has enabled us to work out a very complete line from the smallest to the largest and most powerful.

Cut shows our No. "A" Single Machine for general purpose punching and shearing, driven by belt or motor. Punches 2" through 1 1/4"; shears 2 1/4" round or 6"x6"x7/8" angles; splits 1 1/4" plates.

*Write for fully illustrated
300-page Catalog 21-A*

The Long & Allstatter Company
AMERICAN PUNCH AND SHEAR WORKS
Hamilton, Ohio

"QUICKWORK"

Registered in U.S.A. and Foreign Countries

Rotary Shears

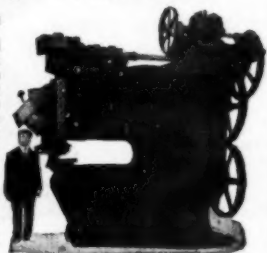
Made in 7 Sizes

Cut all gauges of sheet and plate metal up to 1 inch thick in straight or irregular shapes and openings without cutting in from side of sheet. Leaves square, true edge that requires no finishing. Used in building ships, boilers, tanks, cars & general plate and sheet metal work.

Save 50 to 90%

Eliminates Oxyacetylene cutting and plate planing

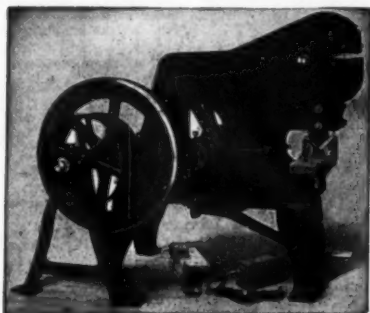
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Patented June 3rd, 1913

THE QUICKWORK COMPANY, St. Marys, Ohio, U. S. A.
Cable Address "Quickwork," "W. U." and "General" Codes

Punches—Shears—Bending Rolls
The Beloit
Combined Power Punch And Shear



Built in six sizes. Nos. 51, 52, 53, 54, 55 and 56

Direct connected motor or belt drive

This is the best all around punch and shear in a combined machine of moderate cost. It is heavy and substantial, and amply back geared to require the minimum amount of power; is strong, compact, and easy to operate. Can be equipped with angle shearing attachment, architectural jaw, or for special work.

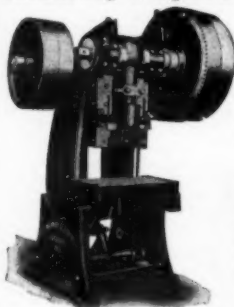
We are putting out a complete line of punching and shearing machinery in both power and hand tools, also light and heavy duty bending rolls.

We do not overrate the capacities of our machines.

Write for catalogue and prices

Hendley & Whittemore Co.
100 S. State St., Beloit, Wis.

Accuracy + Speed — L. J. Inclinable Power Presses



Built along simple, durable and practical lines, embodying every modern convenience necessary for accurate and rapid production, as well as safety to the operator and dies. Cut shows No. 5 Combination Geared.

Our Dealers

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W. J. Baird Machinery Co., Detroit
Herberts Machinery & Supply Co.,
Los Angeles and San Francisco, Cal.
J. L. Lucas & Son Inc., Bridgeport, Conn.
Brown-McDonald Mchy. Co., St. Louis
Northern Machinery Co., Minneapolis
Clark Machinery Co., Cleveland, Ohio
Patterson Tool & Sup'y Co., Dayton, O.
Dale-Brewster Mchy. Co., New York
Swind Machinery Co., Philadelphia, Pa.

Write to the nearest, or

Loshbough-Jordan Tool & Mche. Co.
Elkhart, Indiana

Emco Bench Press



Weight, lbs.,.....130
Stroke,.... $\frac{3}{4}$ " or $1\frac{1}{4}$ "
Capacity,.... $\frac{3}{4}$ "x1-16"

**For rapid production on
Small Parts**

Used in quantities by many large operators.

Speciale—Iron Stand, Die Block, Inclining Blocks, Motor, Counter.

Absolute non-repeat stop on one stroke.

Made absolutely accurate for die and other fine work.

EMCO "W" Bench Pwr. Punch Press

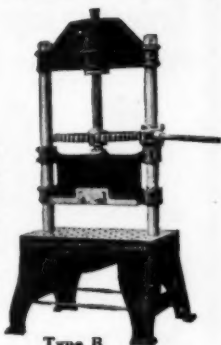
The Enterprise Machinery Co., 28 S. Clinton St. CHICAGO, ILL.

Two Great Machines

Manhattan Type B. Screw Press For Die Makers

Something new. A strictly *one-man machine* which is *guaranteed up to 80,000 lbs. pressure*. Gives perfect alignment to punch and die. Eliminates tendency to gouge or nick. *Much better and easier to handle* than a punch press that costs ten times as much—saves time and labor and insures perfect results.

Better have the folder



Type B

The Manhattan Surface Grinder



A Revelation in quiet efficiency. It is compact, yet so massive and rigid, with over-size phosphor bronze bearings, that there is no vibration under the heaviest work. Dials on both feeds graduated in thousandths. Gives clearance where most needed, and is improved in nearly every feature.

Specifications on request

Let us tell you about one or both of these great machines

Manhattan Machine & Tool Works
Dept. A., Grand Rapids, Mich.

**You Can Depend Upon
Anderson Improved Balancing Ways
For Balancing Anything that Turns on a Shaft**



They are always ready—no adjusting necessary. They have no superior for quick and accurate balancing of cutter heads, crank shafts, aeroplane motors, propellers, armatures, rotors for turbines, etc.

They are perfectly balanced. Rotating discs are made of chilled iron, ground true on face, and run in especially designed ball bearings.

Five sizes, for parts up to 10,000 lbs., cover all requirements.

Let us tell you how to simplify your jobs of sensitive balancing

Anderson Bros. Mfg. Co.
115 Morgan St., Rockford, Ill.



The Reason Why

**T. H. L. Punches
Are Dependable**

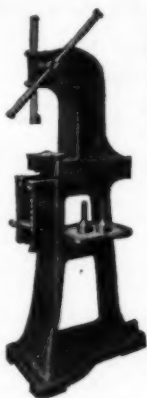
These Punches are the result of nearly 30 years' experience in punch-making, and are adapted to meet all the needs of punch users.

They are accurate and uniformly made of the correct steel, and insure a steady, rapid delivery of high-grade work. They save time, material, and money.

Prompt shipment of all regular sizes; special sizes on short notice.

A trial order will convince you

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415 East 31st St., (Est. 1890) New York City



“—Every Man in the Shop uses that Nicholson Arbor Press”

This is what the superintendent of a machine shop said; also that it saves a lot of labor and you know how expensive labor is today. Another thing he mentioned was the saving of bushings, pinions, pistons, shafts, etc., that were often battered up formerly by a sledge—plus impatience. The price of this Nicholson Arbor Press is only \$29.63. Most shops that use it also use the

Nicholson Expanding Mandrels

because it's another labor saver and speeds production. With a set of these you can instantly fit any size hole—square or round—from $\frac{1}{4}$ " to 7 inches. You'll find that your workmen do more work when they use Nicholson Expanding Mandrels. May we send you a Nicholson Arbor Press—or one, or a set of Nicholson Expanding Mandrels on 30 days' trial? They must prove their worth in dollars or you ship them back collect.



W. H. Nicholson & Co.
117 Oregon Street, Wilkes-Barre, Pa.

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500% Increase In Output



The Grant Rotary Rivet Spinner

Gives a 500% increase in output over hand riveting, and an unskilled boy or girl can easily operate it.

With the Grant Rotary an unusually diversified range of articles may be riveted together by an absolutely *noiseless* and *blowless* method, producing results far greater in quantity, superior in finish and uniformity.

The capacity of this machine is 1 rivet per second. Work produced is uniform from the smallest rivet up to $\frac{3}{8}$ " shank.

Don't you want to look into it?

The Grant Mfg. & Machine Co.
C. E. Station, Bridgeport, Conn.

Partridge Light Punch Press

For making novelties from sheet metal, including such operations as stamping, blanking, piercing, bending, forming, perforating, embossing, shearing and wire cutting. Has exceptional strength for its size.

Carefully adjusted to secure accurate working of the dies, and to prevent shearing. Pendulum action of lever gives a stroke of maximum power without tiring operator. Workmanship and material the best.

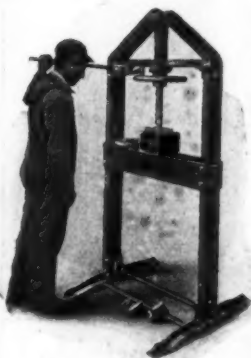
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E. O. PARTRIDGE, 2041-2049 W. Lake St., CHICAGO

Also Bench, Column & Cabinet Grinders, Polishing Lathes, Light Punch Presses, Hollow Mills, Countershafts, Chuck Arbors and Saw Mandrels



Thousands Of **WEAVER 20-Ton Presses**



Are Serving

**Garages
Electric Shops
Machine Shops
Factories
and
Many Other
Industries**

Because of the

wide range of application, great depth adjustment, ease in handling bulky work, greater satisfaction in small work,

Quick Release Feature and the Enormous Leverage

which enables the mechanic or workman to exert a maximum pressure of more than 20 tons without calling assistance.

*For complete description write for Catalog
List price F. O. B. Springfield, Ill., \$85.00*

Special presses of extra width can be furnished at a nominal charge

Weaver Manufacturing Co.

2179 So. 9th Street,

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Atlas Presses

pay for themselves
quicker today than
ever before.

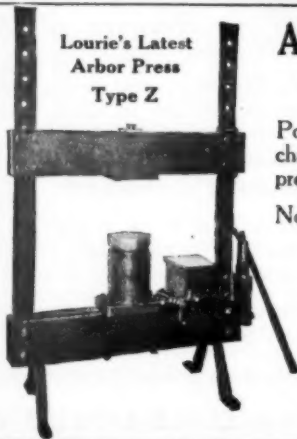
Built in all sizes for all
work which can be
practically accom-
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Atlas Press Co.

Kalamazoo, Mich., U. S. A.



Lourie's Latest
Arbor Press
Type Z



Adjustable Crosshead

Position quickly
changed by hydraulic
pressure.

No heavy lifting.

For Garage
or
Machine
Shop

Lourie Mfg. Co.
Springfield, Ill.

There are Many Styles and Sizes of Greenerd Arbor Presses

With 15 Lbs. to 40 Tons Pressure
For Shops of Every Description

Manufacturers:

There are few up-to-date manufacturing plants without one or more Greenerds, and it ought to be unanimous. Thousands of them have adapted the steady, even pressure of the Greenerd to one or more manufacturing processes, for their convenience and economy of time and labor. Get the Catalog, which may suggest valuable economies to you.

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Wherever used in general machine shops, their handiness and utility for so many purposes have rendered them practically indispensable. The Catalog will make plain to you why they are so universally employed, and how you can adapt them to your own work to splendid advantage.

Automobile Repairs:

Nowhere are Greenerds used to better advantage than in automobile assembling and repairing. The Ford assembling plants use them in considerable numbers. Nothing is quite so good for straightening axles and for removing gears from transmission countershafts. But these are only a couple of their thousand and one uses. The Catalog will make you fully acquainted—better send for a copy.

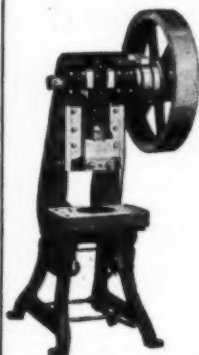
Over 30,000 Feet of Floor Space

Are now used for supplying the demand for Greenerds. Surely you should know something about a device which has the merit to deserve such a wide popularity in all kinds of shops.

Ask your dealer or write for Catalog to—

EDWIN E. BARTLETT, NASHUA, N. H.

Here Is A Press



With Plenty of Steam
Back of THE PUNCH

HIGH DUTY
ROCKFORD
PUNCH PRESSES

Made in straight side and inclinable types. Their great power backed by rigid design enable them to do the work you demand and stand up to it.

Write For Catalog

Rockford Iron Works
Rockford, Ill.

A Machine You Need— Willard Power Press Inclinable Open Back

Does a *large range of work*, including all kinds of blank cutting, perforating, punching, forming and bending of sheet metal. Has many exclusive features. The latch has a *positive safety stop* which makes it impossible for the press to "repeat" until the treadle is pulled clear down; press can be oiled while in motion. *A powerful, accurate and durable* press for hard service.

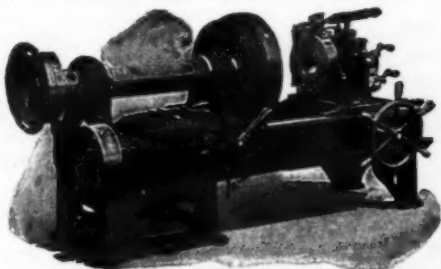


For full information, write to

The Willard Press & Tool Co.
Cincinnati, Ohio

On Straight Runs or Odd Jobs

B. & Ks. Always Save Money



(No. 4 Peerless. Belt Drive. All Gears are Covered)

There are 17 styles and sizes of our Pipe Threading and Cutting Machines, which gives you an adequate choice to find just the right machine for your work. We have them for the manufacturer who must thread big quantities of pipe in quick time, and we also have machines that easily take care of odd jobs and small quantities.

All B. & Ks. are fitted with the Peerless Quick Adjusting Mechanism, which enables you to make instant adjustment to the 1000th of an inch without the use of tools. There are other features that help to increase production and keep down costs with which we shall be glad to acquaint you.

*Our experience of 33 years gives us
every confidence that we can
save you money*

Bignall & Keeler Machine Works
Edwardsville, Illinois

Armstrong Drop Forged Wrenches

Superior Design and Quality



All
Kinds



All
Sizes

Catalog free



Armstrong Bros. Tool Co.

"The Tool Holder People"

308 N. Francisco Ave., Chicago, U. S. A.



? Can You Afford Not to Afford the Hartford Taper Gage

It enables you to see at a glance just where any taper inaccuracies are—also to tell with equal ease when your tapers are O. K.

The tool is simple to operate. May be placed on floor or bench and adjusted to operator's height. Adjustable from No. 0 to No. 14 B. & S. taper. Just put your taper in it and—presto!—inaccuracies of less than 1-1000 of an inch can instantly be detected.

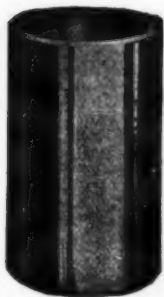
They are not expensive. And they soon pay for themselves in time saved.

*Do you think you can afford
not to afford the use of this in-
expensive, time-saving device?*

Hartford Special Machinery Co.

285 Homestead Ave.,

Hartford, Conn.



An Unbeatable Way of Buying **BRONZE BUSHINGS**

Bunting Straight Dimension
Bronze Bushings are made
in great quantities and car-
ried "IN STOCK."

Your order is filled the day
received and at a lower
price than we or anyone
else could possibly quote,
except for the operation of
this *stock service*.

Ask for Stock List W.

The Bunting Brass & Bronze Co.

*Finished Bronze
Bushings*

and

*Babbitt Lined
Bearings*

**755 Spencer Street,
Toledo, Ohio**



Bunting



For inspection work where limits are close and accuracy and speed essential

1. Measuring Plug Gauges in readings of .0001
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6. Testing Concentricity of Form Milling Cutters .0001
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Any attachments to suit your needs
The Davie is Standard Throughout America and Europe

22 in use in The Ford Motor Plant Akron

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Davie Gauging Machine.
Graduations in .0001
Height 17"—Length 15"—Width 9"

The Davie Tool Co.
E. 118th & Euclid Ave., Cleveland, O.

BURTON, GRIFFITHS & CO., Ltd.
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Agents for Great Britain

SOC. ANONYME ALFRED HERBERT
47 Boulevard de Magenta, Paris
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Simplifies Gauging Systems

Our Amplifying Gauge puts 75% of snap gauges out of business

The over-size or undersize of a piece is instantly shown with the Amplifying Gauge. When gauge is set, parts can be gauged as fast as the workman can handle them.

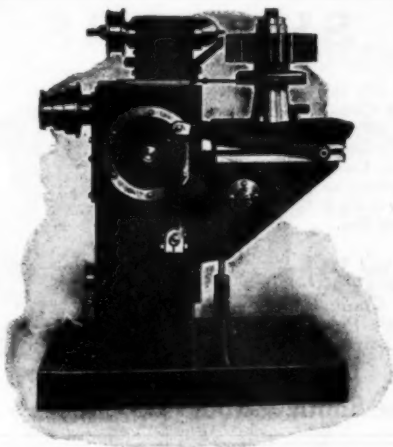
Wherever the Swedish gauge system is used, the "Amplifying" is especially valuable. Used by U. S. Government, and is popular in big automobile plants.

Catalog No. 100 explains; ask for it



THE NORTH SIDE TOOL CO., Dayton, Ohio

Manufacturers of Special Tools, Dies, Jigs and Fixtures



From Tip to Root—

Every tooth *must* come a perfect half circle—that's our guaranty

The Cross Gear Tooth Rounding Machine rounds 24 teeth a minute, and of any pitch from 20 to $\frac{1}{8}$. It handles any number of teeth from 8 to 250, including all prime numbers.

The Cross is the only machine that will successfully round tractor teeth on a production basis—please remember that.

Better write for full data today

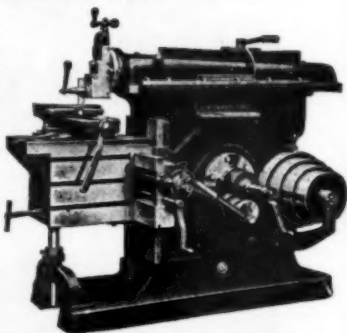
Cross Gear & Engine Company
Detroit, Michigan

Patented here and abroad; sold ONLY by us

SHAPERS

12", 14", 16"
Plain Crank,
16", 20", 25"
B. G. Crank,
either Cone
Driven or
through
Speed Box.

28" and 32"
Back Gear-
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Single Pul-
ley Drive.



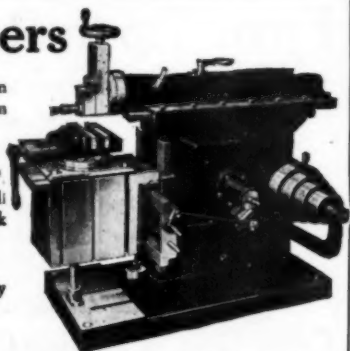
The Smith & Mills Co. Station B.,
Cincinnati, O., U.S.A.

Shapers

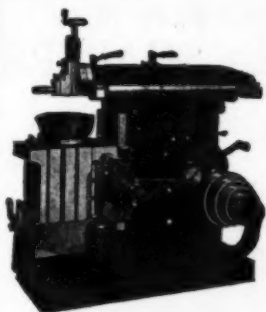
The best medium
priced Shaper on
the market.

Built in 16", 20",
and 24" sizes, all
back geared crank
machines.

A few for early
delivery.



The Osborne & Sexton Mchy. Co.
Columbus, Ohio



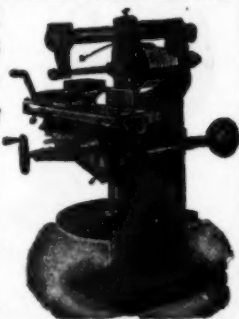
Steptoe Shapers and Millers

are the product of seventy-four years
of experience in the manufacture of

High Grade Machine Tools

Thousands of our machines in shops
giving daily satisfaction are a recom-
mendation for our product which should
not be overlooked
when buying shapers
and milling machines.

*We will be glad to send
catalogues on request*



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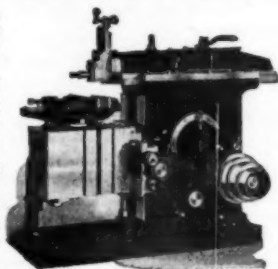
John Steptoe Co.

Stock Yards Station

Cincinnati, Ohio

HIGH GRADE, HEAVY DUTY COLUMBIA SHAPERS

The table support is placed at outer end of table, where most effective. Rigid, substantial, easily adjusted. Support slide is gibbed to table and bearing is hand scraped. Its location under table prevents chips and dirt from getting under and causing table to lift. Complete description of sizes 16", 20", 24" and 28" on application.



The Columbia Machine Tool Company
Hamilton, Ohio

Outlasts Any Other Swager

The Etna Rotary Swager



WILL OUTLAST any other swager built. To insure the greatest rigidity and to prevent wear as much as possible on the bearings there is provided a heavy, well-lubricated bearing in the rear of the flywheel.

The "Etna" is capable of continuous, unrelenting hard work in rapid, accurate reduction of stock by means of a hammer action of immense force and extreme rapidity, striking 3,000 blows a minute. Made in regular sizes to swage $\frac{1}{4}$ " to $4\frac{1}{2}$ " diameter. Write for Catalog.

The Etna Manufacturing Co., TOLEDO, OHIO

**A Small
Tool of
Unusual
Merit**



Convenience and Capacity

You will find these advantages combined in the Rhodes Shaper and Slotter, together with a good measure of real economy in cost and operation.

It makes a specialty of small work, which it handles so much more rapidly than a large machine that it produces a worth-while economy in the saving of the operator's time. Besides that, it costs less and uses less floor space. It has no equal for quick, accurate work on dies, models and small tools.

The Rhodes is built as a $7\frac{1}{2}$ in. horizontal, a $3\frac{1}{2}$ in. vertical, and a combination of the two, in both the floor and the bench types.

Big in capacity, big in economy, but not in price. Send for illustrated circular

The Rhodes Mfg. Company
Hartford, Conn.

"AUSTIN" Practical Knurling Tool

→ Shank Angled to
Knurl Up Close



ALL FORGED STEEL
PAT. APL'D FOR

A novice can make a full uniform impression on any metal, with a minimum amount of strain to the machine. Will knurl from 3-16" to 3" diameter.

Write for price and description

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Solve The Problem

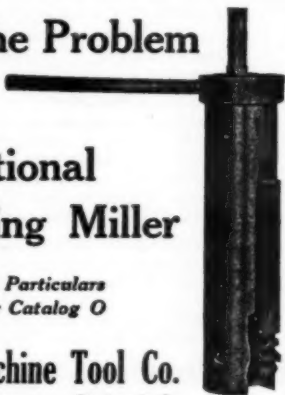
By using

The National Keyseating Miller

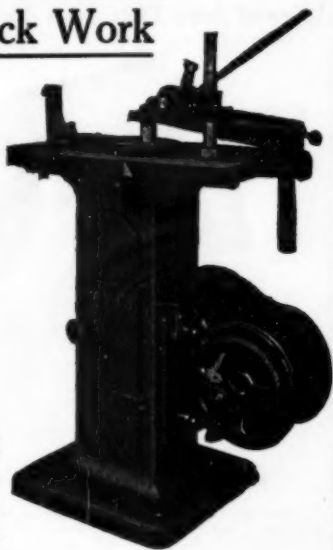
*For Full Particulars
Write for Catalog O*

National Machine Tool Co.

2266 Spring Grove Ave., Cincinnati, O.



Modern Methods for Quick Work



A DAVIS KEYSEATER

Motor driven,
will save you
valuable space
as well as in-
crease your pro-
duction. It is
an investment
you can't afford
to overlook.

Write for Circular

DAVIS MACHINE TOOL CO., Inc.
ROCHESTER, N. Y., U. S. A.

Usable On Any Machine Tool

Universal Angle Plate Saves Time and Money



Protected
by Patents

8"x10" Worm Adjusting—Made in Four Sizes

This up-to-date accessory enables you to machine parts at any desired angle without resetting the work. It converts a plain miller or grinder into a universal machine. Several angles may be planed, shaped or milled on one piece with dependable accuracy. It is the most convenient attachment for the die sinker made in years.

The "Universal" is invaluable for tool room, general machine and repair shop. It moves thru a complete circle horizontally and 90° vertically, and has a vernier attachment reading to 5' for especially accurate work. The addition of centers to the platen permits the grinding of formed cutters.

Worth a good deal more than what it will cost you. Glad to forward full particulars

Boston Scale & Machine Co.
100 Ruggles St., Roxbury, Mass.

Is It Any Wonder That
Government Shops and Navy Yards
Use Catlin Keyseaters?

Because "Catlins" are
Simplest—
Quickest—
Most Accurate



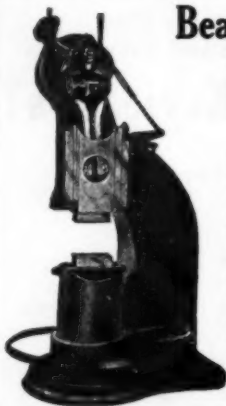
Simplest—"Catlins" have less than half the working parts of any other keyseater. Everything is made heavy without making the machines clumsy.

Quickest—Here are examples of their speed: in 20 minutes keyseats were cut $2\frac{1}{2}$ " long, $\frac{1}{2}$ " wide and $\frac{1}{4}$ " deep, in 20 mitre gears of 8" diameter; in 3 minutes a keyseat was cut 6" long, 1" wide and 7-16" deep, in a cast-steel hub.

Most Accurate—"Catlins" will cut any number of duplicate keyseats accurate to even better than 1000th of an inch.

Write for large illustrated folder. Glad to send it

Chattanooga Machinery Company
Chattanooga, Tenn.



Beaudry Hammers

For General Forging

Saves Fuel, Time and Labor.
Cuts Forging Costs in Two.

Belt or Motor Driven

Beaudry & Co., Inc.

141 Milk St., Boston, Mass.

SALES AGENTS—Brown & Zortman Machinery Co., Pittsburgh, Pa.; W. M. Pattison Supply Co., Cleveland, O.; Eccles & Smith Co., San Francisco and Los Angeles, California; Hallidie Mchy. Co., Inc., Seattle, Wash.; The Portland Mchy. Co., Portland, Ore.; Sherritt & Storer Co., Philadelphia, Pa.; The English Tool & Supply Co., Kansas City, Mo.; The E. L. Essley Mchy. Co., Chicago, Ill. and Milwaukee, Wis.; Alfred Herbert, Ltd., Coventry, Eng.; London, Paris, Calcutta, Yokohama; H. S. Gray Co., Honolulu, T. H.



It's Portable

The Barr Pneumatic Hammer

Is recognized today by progressive shop men as the ideal light power hammer!

A tool which should be in every up-to-date shop and tool room. A tool which repays its cost in short order and which you will truly appreciate every day you own it.

Expertly designed—exceptionally well built—simple—economical and dependable. Installed just where you want it, without expense of foundation, belts, shafting or motors.

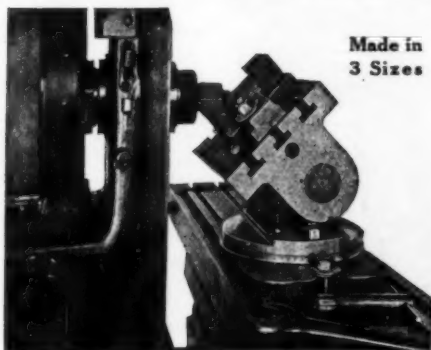
Readily moved right to the job inside or outside.

Write for Bulletin 10H.



The Reid

A Universal Angle Fixture
Of Great Quickness and Accuracy



THE DOUBLE VERNIER gives instant readings of 1-12th of a degree, and even a finer adjustment with a sine bar. Swivels 360 degrees horizontally and 180 vertically. Invaluable for quick setting of work for drilling, milling, planing, shaping and grinding, as well as for die sinking, tool and experimental work.

The "Reid" does away with haphazard set-ups and makes it easy for an unskilled operator to do accurate work in the shortest time. The design eliminates all overhang. It is made to withstand the strain of loads that are even beyond ordinary requirements without chatter or distortion.

It will be our pleasure to explain fully upon request

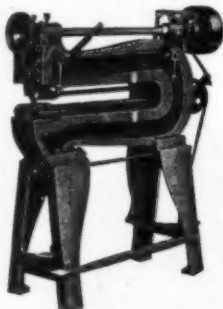
Reid Bros. Co. 59 Park St.
Beverly, Mass.

Export Department, 77 Broad St., New York City
English Agents, Oliver Machinery Co., Ltd., 201-03 Deansgate, Manchester, Eng.

Also Manufacturers of the Reid Surface Grinder

Need A Good Metal Cutter?

The New "Gray" Can't Be Beat



**Cuts All Kinds
Of Sheet Metal**

Respective capacities of Nos. 0, 1, 2 & 3:

18" throat,	1/8" plate
34" "	3/16" "
36" "	3/8" "
36" "	5/8" "

Has an unlimited scope of work. Accomplishes such tasks as cutting out stripping plates for die work, blanks for irregular forming shapes, jigs, engine liners, etc. Will start to take out a kerf anywhere on sheet. No buckling or springing. Takes sheets up to $\frac{3}{8}$ ".

Better write for full details

W. J. SAVAGE CO., Knoxville, Tenn.

A 100 per cent Investment in 30 Days

And the Saving is ALL "Velvet" Thereafter

Peter Bros. Abrasive Metal Cutter often pays for itself within the first month. It will enable your tool makers to do work easier, better, quicker, and 75% cheaper. It has no equal for cutting high-speed and other hardening steels. No better cutter can be found.

8" Size \$22.50, with C. S.

Splendid for tool room. Cuts high-speed steel up to $\frac{1}{2}$ " square.

12" Size \$60, with C. S.

Cuts up to 2 $\frac{1}{2}$ " diameter, round or square, at any angle up to 45 degrees. Ball bearing.

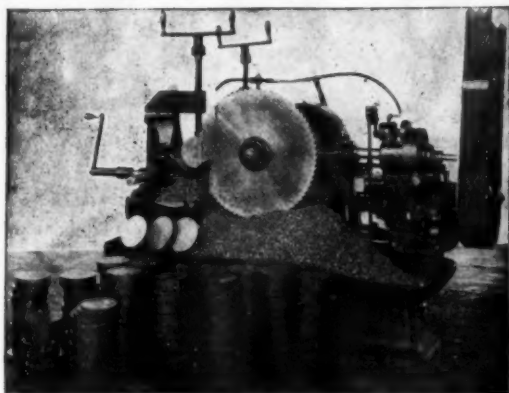
15 Days' Free Trial

Write us or ask your dealer

PETER BROTHERS MFG. CO.
115 Railroad St., Algonquin, Ill.



Cochrane-Bly No. 5 Cold Saw



144 Blanks $5\frac{1}{4}$ " Diameter Cut on This Machine in 8 Hours.

Actual Cutting Time Was 3 Minutes and 10 Seconds Per Cut.

Will Also Cut in Multiple at one Time

76 Bars $\frac{1}{2}$ " Diameter

26 " 1 " "

13 " $1\frac{1}{2}$ " "

8 " 2 " "

4 " $2\frac{1}{4}$ " "

Five Sizes to Suit All Requirements up to $8\frac{1}{2}$ " Round Bar.

Write for Catalog

Cochrane-Bly Company
Rochester, N. Y.



Style "C"



The Hinge



Style "Y"



Style "B"



Style "G"



Style "O"



Style "L"



Style "T"

GITS OIL CUPS

Give perfect satisfaction where others fail. State style and size in which you are interested, and we will send free samples and catalog.

GITS BROS. MFG. CO.

1940 50. KILBOURN AVE., CHICAGO



Style "H"

Steel Handles

Ball Crank, Compound Rest, Ball Lever Handles, etc.

The price is below manufacturing cost of cast or forged handles, and in quality there is no comparison, being accurate, highly finished and ready to attach.

Get our catalog of standard handles, with prices and discounts, and note the many advantages.



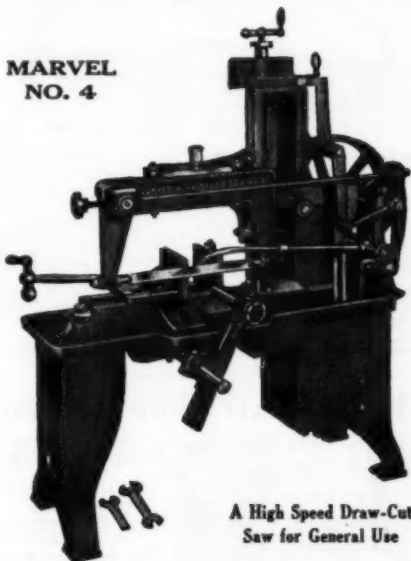
The Cincinnati Ball Crank Co.

Oakley, Cincinnati, Ohio

Cuts 6" Cold Rolled Steel in 10 Minutes

And Smaller Sizes in Proportion

MARVEL
NO. 4



A High Speed Draw-Cut
Saw for General Use

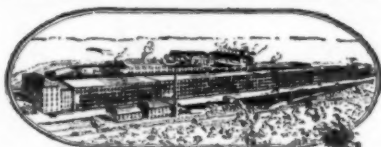
Built on machine tool lines. Cutting speed exceeds all others. *The blade is always in a horizontal position.* Swivel vise that swivels either way. Full of improvements. Furnished motor driven if desired.

Write for full description of Marvel No. 4 and other Marvel Saws for cutting metal and costs

Armstrong-Blum Mfg. Co.
341 N. Francisco Ave., Chicago, Ill.

MORSE SILENT CHAIN DRIVES

For All Transmission Purposes



The largest factory in the world devoted exclusively to the manufacture of silent chain power transmission, from the smallest to 5,000 h. p. Flexible as a belt, positive as gears, longer life than either. Write for the surprising "Chain of Evidence."



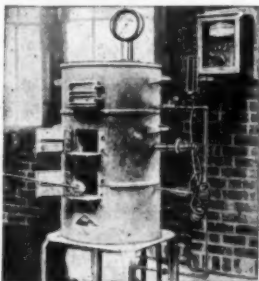
Morse Chain Co.
Ithaca, N. Y.

*Morse Engineering Service
Assistance Free*



A Good Way To Save—Install

The "TRIAD" 3-in-1 Furnace



**Cost of Fuel
Reduced Two-Thirds**

Has three compartments for:

- (1) Pre-heating
- (2) High-heating
- (3) Drawing the temper

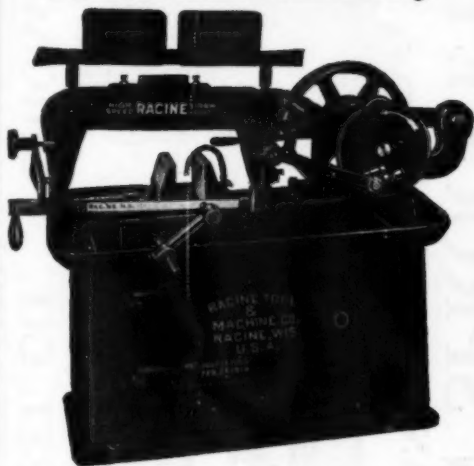
These operations can be carried on simultaneously. One burner, for gas or oil, instead of the usual three, heats all three sections.

It is more efficient than three separate furnaces. Its cylindrical shape insures absolutely uniform heating. Heats high-speed steel in 20 minutes from a cold start. No oxidation.

Write for Catalog No. 5

The W. R. Bennett Co., P. O. Drawer X
Elmwood, Conn.

Essential Economy



The "Racine"

High Speed Metal Cutting Machine

is in operation in all plants where economy of operation is carefully investigated.

It saves blades, saves material, saves time and labor. 30 different types.

Catalog "H" will be sent on request

Racine Tool & Machine Co.

Racine, Wisconsin, U. S. A.

CULLMAN SPROCKETS

STOCK AND TO ORDER



Diamond, Whitney, Baldwin, Duckworth and
Coventry Chains, Block, Roller and
High Speed Silent types on hand



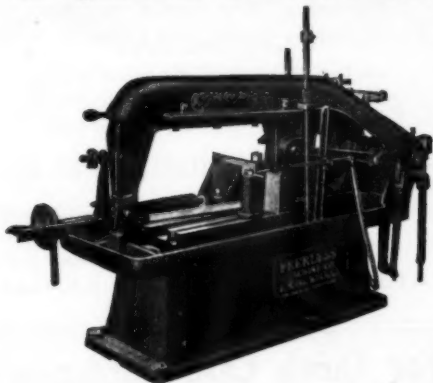
CATALOG

CULLMAN WHEEL CO.,
1359 ALTGELD STREET

CHICAGO

Peerless **HIGH SPEED**

Six Speeds for Different Metals



Here is another "Peerless" improvement. We furnish this modern standard saw, when desired, with our Six-Speed Quick Change Gear Box—not shown in the above cut. It gives a range of 50 to 150 strokes a minute, with a change of about 20 strokes on each gear, and is built for hard and constant work with the least possible amount of wear.

In any shop where soft steel or metals of varying degrees of hardness have to be cut, these changes of speed insure a *much larger output*, with a *great saving in blades* which alone pays for the Six-Speed Gear Box in a short time.

This is only one of the many improvements which enable the "Peerless" to increase production from 50 to 100 per cent in all kinds of metals. You can have it either with or without this feature, also with or without motor.

Write for complete description and our 30-DAY TRIAL OFFER

Peerless Machine Company

1609 Racine Street,

RACINE, WISCONSIN

CASE HARDENING MATERIALS

If you are using a lead bath for tempering you should use our

"CLEANCOAT"

on top to protect the lead from the air and brush off the lead from the steel in withdrawing it from the bath.

CHEAPER THAN CHARCOAL, HAS NO ASH

Try it. We will give you enough to cover your lead pot.

Bell & Gossett Co.

613 W. 30th St.,

Chicago

For Quick Case Hardening? Use Case Hardo—Of Course!

Works Quicker, Hardens Better, Costs Less

Requires less heat—only about 1400 degrees Fahr. when used in any cyanide furnace, and is therefore *quicker*.

It is better because it produces a glass-hard surface, of a good color, with deep penetration. It throws off no poisonous fumes.

It is by far the most economical because it saves labor, fuel and time, it costs less, and it hardens more work than an equal weight of any other hardening compound. Four years' general use has proven its reliability, and we know the results will please you.

Made Only By

The Thos. Buchanan Company

29 W. 3rd St.,

Cincinnati, Ohio

Established in 1886



Is Always Dependable

But there are other reasons why it pays to use Ferro Case for case-hardening. It produces a deeper, cleaner, better case than cyanide. In fact, its thorough efficiency has placed it ahead of all other case-hardening materials. It leaves no soft spots—it all comes glass hard.

It Is Non-Poisonous

Your men work in perfect safety—no poisonous fumes as when cyanide is used.

Does Not Spoil With Age

—and can therefore be stocked up freely, enabling you to purchase in quantities that entitle you to a better price. Ferro Case carbonizes at a lower temperature, and assures you of the greatest all 'round economy.

Ferro Case M is for use in the cyanide melting furnace, and is handled the same way.

Ferro Case S is for sprinkling on hot steel. Kindly state the grade desired.

*We solicit a trial order—repeat
orders take care of themselves*

C. G. Buchanan Chemical Co.

Sta. H., Cincinnati, Ohio, U. S. A.



Blueprints

The Wickes

Continuous Electric.
Sells at **half the price.** Uses **half the current** of others. Perfect prints up to 48" in width and of unlimited length.

Dept. H

Water Street,
Wickes Bros., Saginaw, Mich.

A Place For Everything

Pays Good Dividends—Always

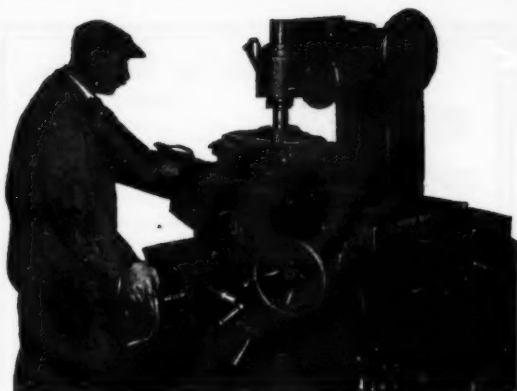
A Modern Bench

Solidly built, well finished, easy to clean, with a 5-inch guard around three sides of the top, six drawers, one blueprint slide, a shelf, and three large compartments for stock—a place for everything and everything in its place.



Installed in numbers by leading manufacturers to increase the efficiency of their tool makers and bench hands. It is a wonderful help. *Write for full particulars.*

THE RITCHIE-WERTZ CO., Dayton, Ohio



Heald Magnetic Chuck on a Miller

The casting was laid on the chuck, the switch thrown in and a $2\frac{1}{4}$ " cutter running 85 ft. per minute took a 5-16" cut at a feed of $6\frac{1}{8}$ " per minute. There was not the least sign of vibration or tendency to lift. This is four times as fast as with the mechanical fixture. The whole secret is the greater bearing surface and the Heald Magnetic pull.

Write for Bulletin 371-372 and Series 300

THE HEALD
MACHINE COMPANY
Worcester, Massachusetts

All Machine Dealers Will Supply Heald Chucks



Are You Looking For Hobs?

Our line of "Quality Tools" consists of only the highest-class tools, both in material and workmanship. Every step in their manufacture is under constant inspection. All tools are *exactly* right before they leave our plant.

For Milling Cutters?

No milling machine is better than its cutting tools. Michigan cutters insure accuracy, more production and cutter economy.

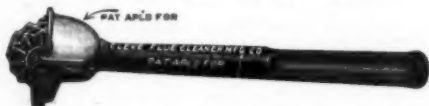
Special Tools?

Our tools cut smoothly and accurately, and are distinguished for *quality*. Do you need *good* cutting tools?

Drop us a line now

Michigan Tool Company
Detroit, Mich., U. S. A.

"Duplex" Emery Wheel Dresser With Detachable Aluminum Hood



This *patented* hood adds but little to the weight of the Dresser and *protects the operator* against flying particles.

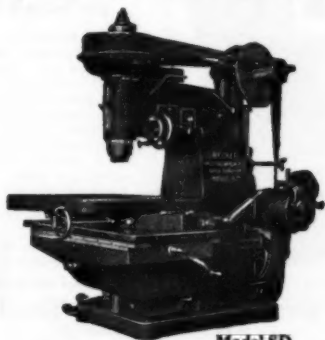
The handle is both simple and durable. You can get it equipped with: (1) the "Diamond" Cutter, designed for truing large, coarse wheels, which does the best work of any dresser made; or (2) the "Improved" Cutter, designed for truing medium and fine wheels. These cutters also run on a bronze bushing.

Glad to send one on trial. Your address?

Cleveland Flue Cleaner Mfg. Co.
321 Frankfort Ave., N. W., Cleveland, Ohio

BECKER

The Machine that Gives the Smooth Finish



Model SD

Superiority of Ranges

is a salient feature that has earned a high place in the Machine Tool Industry for

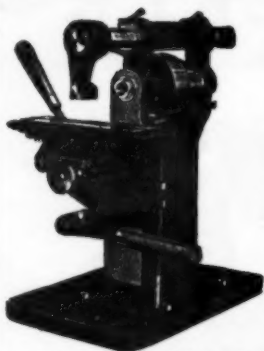
Becker Belt Driven Millers

The Internal Belt Drive provides an elastic feed to the spindle, eliminating chatter and prolonging the life of the cutter used.

As a production tool The Becker is without an equal.

Circular S701 tells why. Write for it today

Becker Milling Machine Co.
Hyde Park, Boston, Mass.



Burke's No. 3 Bench Millers

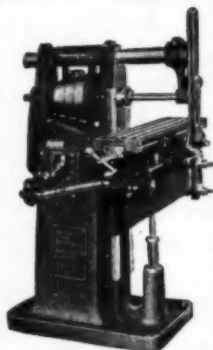
Are Seasoned Tools

Our system of tests insures accuracy, and our methods of construction make it permanent. Frames and parts are carried 6 to 8 months, after work begins on them, before the completed tools receive our final O. K., and all parts are finished and fitted with exceptional care.

Longitudinal feed, 6 in.; traverse feed, $3\frac{1}{2}$ in.; vertical motion of knee, 8 $\frac{1}{2}$ in.; table surface, 3 $\frac{1}{2}$ x12 inch.

Write for Catalog, which also shows larger and smaller sizes.

The Burke Machine Tool Co.
Conneaut, Ohio



A Powerful, Accurate Plain Miller

THE DAVENPORT No. 2-B Plain Miller has unusual power and accuracy. Our original construction of the arbor support insures long life without wear and aids greatly in preventing chatter and insuring accuracy.

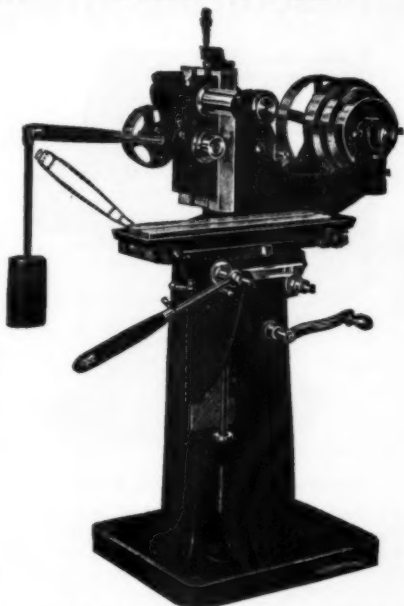
The gear box gives 12 feed changes; gears are of special alloy steel; the drive is by roller chain from spindle, which is of forged crucible steel, with adjustable bronze bearings. There are other features of special merit.

Write for the specifications and look them over

THE DAVENPORT MFG. CO., Meadville, Pa.

"Whitney" Hand Miller

THOUSANDS IN USE



Powerful and simple in operation. The handiest machine for light milling, keyseating, profiling, die sinking, gear cutting, etc.

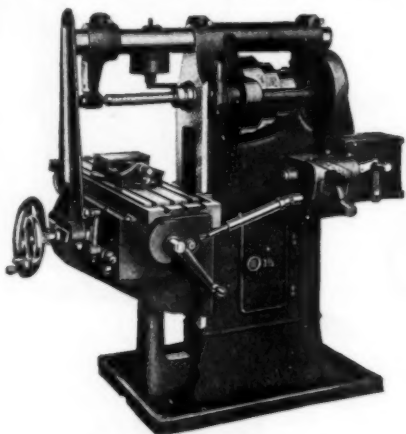
Immediate Deliveries

But they are going fast. Don't wait! Send your order in at once.

The Whitney Mfg. Co., - Hartford, Conn.

Chains—Keys—Hand Milling Machines

A Thoroughly Dependable Manufacturing Miller



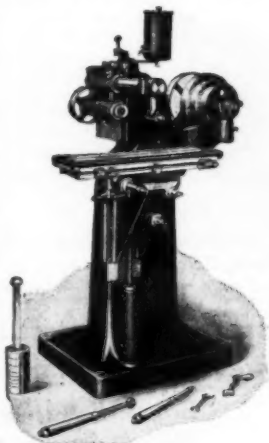
American No. 1½ Plain Back Geared

Here are a few condensed items from the specifications:—
A 3-step cone pulley for 3" belt. High carbon steel spindle accurately ground, running in high-grade bronze bearings with felt oil retainers. The 12 feed changes are under perfect control by lever on front of feed box. Also 12 spindle speeds. Adjustable dials, graduated in thousandths, on table and cross and elevating screws. Equipped, if desired, with a strong, accurate Vertical Spindle Milling Attachment bolted to face of column.

The complete specifications will give you a better conception of this splendid tool. May we send them?

The American Milling Machine Co.
Cincinnati, Ohio, U. S. A.

Hand and Weight Feed U. S. No. 1 Improved Miller



For
the faster and
more econom-
ical milling of
small machine
parts

A machine of quick adaptability and wide range, with great power for its weight.

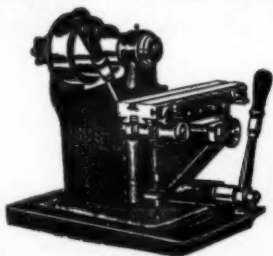
The vertical and horizontal feeds are independent and permit work being held close to table, so that it may be used as a profiler. The vertical lever feed being independent from the table and the head accurately counterbalanced, light milling work can be done on long or heavy pieces without danger of breaking cutters.

The descriptive circular shows why there are so many operations, especially in the milling of small parts, which can be done on this machine faster and more economically than on big, expensive millers.

We shall appreciate the opportunity to explain. May we?

The United States Machine Tool Co.
Cincinnati, Ohio, U. S. A.

Just The Machine



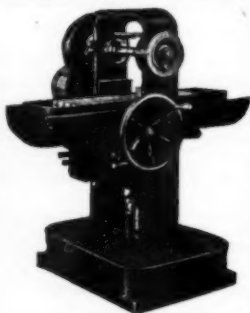
for those light cuts on details for Fire-arms, Sewing Machines, Typewriters, Bicycles, Electrical work, and a thousand and one other details used in the manufacture of the various products of the manufacturing world.

Send for description circular

The Carter & Hakes Machine Co.
West Winsted, Conn., U. S. A.

AGENTS—for New England and New York, Hill, Clarke & Co.
WESTERN AGENTS—Marshall & Huschart Machinery Co.,
Chicago, St. Louis, Indianapolis.

Rigidity--Power--Convenience



Briggs High Duty Milling Machine

Rigidity—The direct geared drive and the heavy table enable the machine to cut hard steel on wide cuts without the slightest chatter.

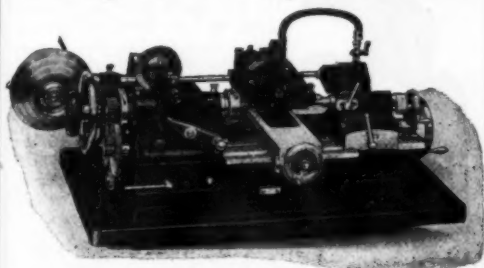
Driving Power is greater than that of any other miller of its size and weight: $3\frac{1}{2}$ " double belt with gear ratio of 4 to 1.

Convenience of Operation—Table has powerful screw feed. It is provided with a quick return consisting of a rack, pinion, and hand wheel.

Has other superior features. Write for full details.

GOOLEY & EDLUND, Inc., Cortland, N. Y.

Lower the cost of your thread milling with the rapid Waltham



Best Adapted for Work Not Over 2" in Diameter

The Waltham is for bench use, and the complete machine is for universal use. It is especially adapted for tool rooms, experimental departments, etc. When needed as a single purpose machine for manufacturing, certain parts may be omitted, which of course reduces the cost in proportion. In manufacturing operations one ordinary operator can take care of several machines.

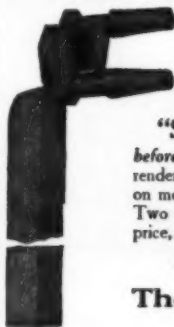
There are a number of especially valuable features, such as a Compensating Bar, for varying the lead of thread, to make allowance for changing in hardening; a Taper Cutting Attachment; an Index of 12 divisions on work spindle, for obtaining multiple threads; a Graduated Lever, for longitudinally adjusting the cutter to match threads previously cut, etc. 16 feeds are obtainable.

If you have any thread milling to do, the Waltham can save you money. Send for full description and let us have samples for production estimate.

Waltham Machine Works
Cutter & High Sts., Waltham, Mass.

Why Wait Till Accidents Occur

To Install "Safety First" Belt Sticks?



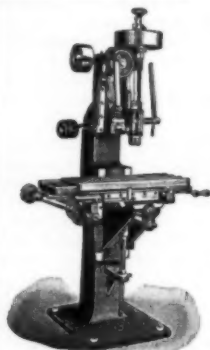
The best way to keep your horse is to lock the barn *before* the horse is stolen. And the best way to prevent accidents to the men and women in your shop is to get

"Safety First" Belt Sticks

before accidents happen. These belt sticks render impossible all accidents in putting belts on moving pulleys. They *can't* get caught. Two sizes, 1" to 4" and 4" to 6", at one price, only \$1.25 each or \$12 a dozen.

Safety First is the best policy

The Ready Tool Co.
Bridgeport, Conn.



A Superior Vertical Miller With Slotting Attachment

The Clough No. 2 is provided with dials reading to 1000's of an inch. Its superiority is due to its convenience, rapidity and accuracy.

Unexcelled for blanking dies, die sinking, metal patterns and light machine work. Tool block can be swiveled around for cutting cross or lengthwise of the table.

Size of table.....28"x9 1/4"
Lengthwise auto feed 21"
Cross motion.....9"
Vertical adjustment.....15"

We can always interest the economizer. Catalog?

R. M. CLOUGH, Meriden, Conn.

Money Earner

Greater Output

Money Saver

Lower Costs

Replaces Hundreds of Solid Tools



The Genesee Adjustable Hollow Mill

A money earner. It maintains on steel a cutting speed of 12" to 15" per minute, and is a general increaser of production. Designed to utilize machines to their full capacity. Can be adjusted in a few minutes to 1000's of an inch.

A money saver. It differs from solid tools in several important respects: it cannot clog nor change size; only 14 sizes cover the entire range from $\frac{1}{4}$ " to 2", replacing hundreds of solid tools; one set of blades will outlast 3 to 5 solid tools.

What more can you ask? Why not put your jobs up to our engineers for rapid production?

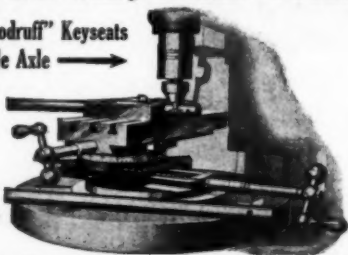
Genesee Manufacturing Co., Inc.
Rochester, N. Y.

**Manufacturers of Adjustable Hollow Mills, Facing Tools, and
Inserted Tooth Face and Side Milling Cutters**

Mills On Any Drill Press

Cutting "Woodruff" Keyseats
In Automobile Axle →

For the
Garage
Diemaker
Repair Shop
Patternmaker



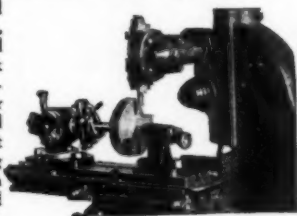
The Davis Milling Attachment and Compound Table can be used on any drill press from 14 to 42-in. swing. It is equally valuable in big and small shops, as it does most of the lighter jobs as well as a large, expensive machine; cuts all kinds of keyseats perfectly. Our cylinder reamers for reboring the Ford car, and our efficient air compressor are also attractively priced. Send for circulars.

Hinckley Machine Works, HINCKLEY, ILL.

A Real Economy Device

The Whiting & Comstock Dividing Head Transforms
Your Hand Miller into a Semi-Universal

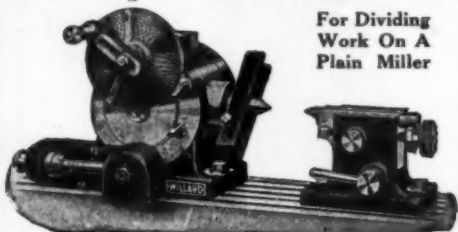
You can then mill cutters, reamers, counterbores and similar small work quickly and accurately, while your expensive universal machines are left open for the big jobs. Production is increased and costs are lowered.



Write for full description of this economy device

Whiting & Comstock, 32 Union Place, Hartford, Conn.
Export Department, 77 Broad St., New York City

An Up-To-Date Tool



For Dividing
Work On A
Plain Miller

Built in very *liberal proportions*. Easily handles the heaviest cuts encountered on a plain miller. Graduated *swivel head* can be set anywhere from 10 degrees below the horizontal to 10 degrees beyond the vertical. *Worm, worm wheel and index pin* are relieved of all strain by means of an efficient *locking device*. Write for details.

THE WILLARD PRESS & TOOL CO., CINCINNATI, O.

Pat. Jan. 30, 1917

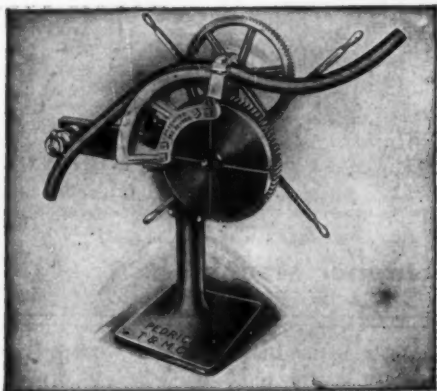


Just What I Want

Automatic Extension Reel for Electric Lamps.
Light just where wanted.
25 ft. of cord.
Automatically locks and rewinds.
Approved by underwriters.

The Cincinnati Specialty Mfg. Co., Inc.
1913-21 Powers St., - Cincinnati, Ohio
Branch Offices:
205 Albert Bldg., Philadelphia, Pa.; 39-41 Cortlandt St., New York

Our Pipe Benders Meet The Demand



Ever since their invention our hand Pipe Benders have had a steady sale and have given universal satisfaction.

Recently, we have made some improved attachments that permit of a wider range of work and open up a new field in the kind of bending the machine will accomplish.

If you do pipe bending you will find our machine an economical, simple and very efficient appliance in reducing costs and doing better work. For 2" and under.

We have a Bulletin waiting for you. Send for it now.

Pedrick Tool & Machine Co.

3644 N. Lawrence St., Philadelphia, Pa.

Manufacturers of Cylinder Boring Bars, Portable Millers, Crank Pin Turning Machines, etc.

Unerring Accuracy Guaranteed

"Schipper" 10 Inch-Universal Index Centers

Light but Rigid



These centers are *always accurate*. The metal is distributed where strength is most needed so that they are very rigid and yet weigh only 85 lbs.

Graduated head can be set at any angle from 10 degrees below the horizontal to 10 degrees beyond the perpendicular.

Why not ask about them now?

Schipper Machine & Tool Co.
Aurora, Indiana

Dickow's 10-in. Universal Index Centers Have Time and Labor Saving Accuracy



PROMPT
DELIVERY



Patents Pending

Production is naturally increased. You will like the improvements—new steel Crank and Sector; new Spindle Lock, etc.

For Dependable Accuracy Get Dickow's
Sold by dealers. Write us for complete description.

Fred. C. Dickow, 1858 W. Lake St., Chicago, Ill.

Riveting Revolutionized

"The Hammer with the human stroke"

Heads Rivets Cold



Heads 'em tight or loose, flush, countersunk, or finishes heads any shape desired at the rate of:—

A rivet a second, sizes up to 3-16 in.

A rivet in two seconds, sizes 1-4 to 3-8 in.

A rivet in three seconds, sizes 7-16 to 5-8 in.

Built in Eight Sizes

To handle rivets from the smallest, up to $1\frac{1}{2}$ " in diameter. Send us sample assembly parts with rivets or sketch of your work, and let US shoulder your riveting problems.

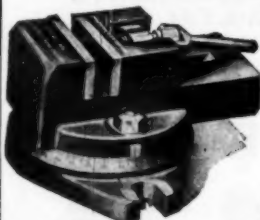
Send for the High Speed Hammer Book

Department 13

The High Speed Hammer Co., Inc.

Rochester, New York

**CAN BE OPENED, CLOSED AND CLAMPED
IN AS MANY SECONDS**



The Vise With Virtue

**Nestor Quick-Acting Drilling and Milling
Vise.** Four sizes, 2½, 4, 6 and 9 inches.

Immediate shipment

We have exceptional facilities for light manufacturing, jig, die, fixture, gauge and punch work. Let us know your requirements for quotations.

This cat-quick vise with a grip like a bulldog is easily the best vise buy on the market today.

Precision-built and with extra capacity the

**Nestor
Vise**

stands supreme. Let us tell about the special, quick-sliding jaw in detail. Also made with square, flanged bottom, sides and ends.

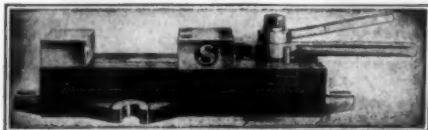
**Write TODAY for
description and prices**

Nestor Mfg. Co., Inc.

40 W. 13th St., New York City

The General Purpose Vise

"Supreme" Quick-Action—Simple and Durable



Patented May 8, 1919

A better vise for general purposes cannot be found.

It has a *larger range* than other vises of the same size.

It is *durable*, having nothing which can get out of order.

It is *easily and quickly operated*. One push against the cam lever draws the work down in the vise and *securely clamps it*.

Write for literature describing its "10 Superior Features."

SPAFFORD TOOL WORKS, - Hartford, Conn.

Export Department, 77 Broad St., New York City



WHY YOST VISES?

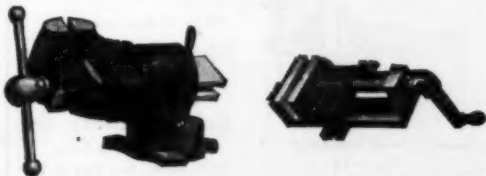
Because the best vise judges, the men who use vises in machine shops all over the world, have given them unqualified approval.

Because they are designed and proportioned to give the user the greatest possible convenience, combined with strength to withstand usual and unusual stresses, and a dependable reliability that is a guaranty of service.

Because they are manufactured in a thoroughly modern plant, with all needed facilities, and by men who are trained for this special work.

*Let us send our catalogue, and suggest
the best vise for your particular work*

Yost Manufacturing Co.
Meadville, Pa.



Gem Drill Vise



**Strong and Durable
Quick in Action
Powerful Grip**

Made by

J. E. Martin Tool & Die Co.

548 West State Street,

Springfield, Ohio

Star Vises

THAT efficient service over a long period is a recognized characteristic of Star Vises is shown by the steadily growing list of manufacturers who are adopting Star Vises as standard equipment.

"Star"



Standard Machinists' Bench Vise

Warranted

**Made in all Standard
Sizes and Types**

Write for illustrated catalog

Fulton Machine & Vise Co.

Lowville, N. Y.

SOLE SALES AGENTS

**Boker Cutlery &
Hardware Co.**

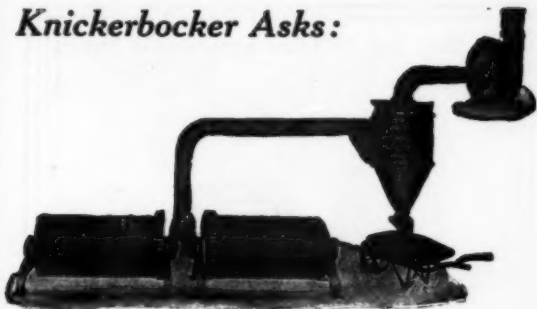
101 Duane St., New York, N. Y.



Universal Swivel Toolmakers' Vise

Warranted

Knickerbocker Asks:



Why do engineers of big plants so often specify "Rarefieds"?—



The list of users of the "Rarefied" Dust Collector is convincing proof of its universal success. Among them you will find the names of firms who are internationally known, and whose every re-order meant a strong endorsement of the 'Rarefied.'

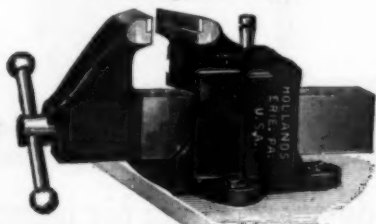
The engineers of these big plants are in touch with every make of Collector the market affords, and the "Rarefied" won on its merits every time.

We should like to send you a copy of our Booklet, and answer questions relative to the efficiency and economy of the "Rarefied"

The Knickerbocker Company
Jackson, Michigan

We Have Had 32 Years' Experience in Making Hollands Machinists' Vises

"You Reap the Harvest"



Strongest, most rigid vise made. Let us post you

HOLLANDS MFG. CO., Erie, Pa.
Established 1887

Particularly Adapted To The Drill Press Quick Acting Cincinnati Vise **Three Sizes: 3½", 5" and 7"**



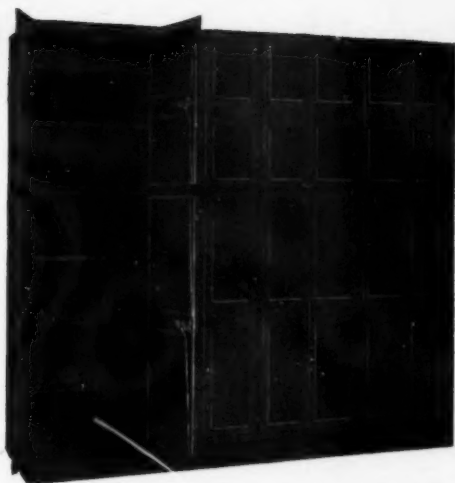
Dimensions of No. 5

Width of vise 5"
Vise opens 6"
Width of jaws 5"
Depth of jaws 1½"
Opening thru
center of base 1½"

Guaranteed true in all three positions in which it is placed. From either standpoint—construction or production—it will fully meet all requirements for this kind of vise. To operate, shove sliding jaw up to the work and give a turn of the screw—time, 3 seconds.

Particulars on request by return mail. Write to

Cincinnati Vise Company
Station H., Cincinnati, Ohio, U. S. A.



Terrell's Steel Bins and Shelving

With or Without Fire-Proof Doors

Any of our standard shelving units, new or old, may be equipped with fire-proof steel doors, which are easily removed, replaced or shifted from one place to another.

Terrell's Steel Fixtures mean *economy, convenience, and conservation of space*. Their adaptability to meet changing conditions recommends them particularly to growing concerns. Install what you need now, and add to them or change them around as desired, without loss or damage.

*Write for estimate on filling your requirements
The cost may be less than you think*

Terrell's Equipment Company

Hall & Division Sts., Grand Rapids, Mich.

Also ask about Terrell's Unit System of Steel Lockers

Standard Boring Bar—Any Size

For Lathe Work—Automatic or Hand Feed

Figure 122



THE UNDERWOOD Boring Bar can be removed and reset as often as required without changing original alignment. Has continuous geared feed with two changes.

It is quickly and securely bolted to the face plate, which gives it all the rigidity of the lathe and also centers that end of the bar. Besides doing perfect work, the Underwood Bar enables you to use the whole power of the lathe.

We have been building Portable Tools for nearly half a century. Our line now includes:

Millers; circular planer tools; radius planers; rotary planers; machines for truing eccentrics, facing domes, arms for facing cylinder flanges; rotary flue cleaners; armature and axle bearing borers; pipe benders; locomotive cylinder borers; boring bars for lathe work; crank pin turners; reflex water glass grinders, motors, etc.

If interested in economy, send for our Catalog

H. B. Underwood Corporation

1015-25 Hamilton St., Philadelphia, Pa.

Second-Hand Machinery.

Lists of Second-Hand Machinery, either for sale or wanted, set in uniform style, will be published under this heading at the rate of **50 cents a line**, across the page, each issue. Minimum charge, **\$4.00**. Sub-headings are counted as one line, but the name and address of advertiser are not included in the space charged for. No display in this department.

Write directly to those offering the machines for sale for prices and full descriptions. If what you require is not listed, use the blank enclosed to make known your wants to the publisher.

FOR SALE BY

H. C. Marsh Co., - - - - **Rockford, Illinois**

LATHES.

16"x 6' Rockford lathes, (6), each.....	\$ 375.
20"x8" Putnam lathe.....	225.
Porter-Cable speed lathe.....	100.
Daniels single purpose lathes, (6), each.....	225.

FOR SALE BY

H. C. Fincham, - - - - **635 Oswald St., Toledo, Ohio**

Arbor press, 20-ton Weaver.
Coal-oil engine, 10 h. p. Nova.
Engine lathe, 15"x8" Porter.
Gasoline engine, 6 h. p., line shaft, hangers and pulleys.
Hack saws, (2).
Motor, 85 h. p. G. E., 440 volt, 3 phase, 25 cycle, complete.
Square shear, 20".

FOR SALE BY

Brownell Machinery Co., - **11-13 Eddy St., Providence, R. I.**

Drills, 2-spindle Allen, b. b.	Grinder, No. 16 B. & S. plain.
Drills, 3-spindle Allen, b. b.	Lathe, 14"x 6' Reed, r. & f.
Drills, 1-spindle 16" Millbury.	Lathe, 16"x8' Reed, r. & f.
Drills, 26" Sibley.	Milling machine, No. 21 Garvin.
Drills, 6' Newton radial.	Milling machine, No. 25 Bilton.
Grinder, Greenfield, c. & r.	Milling machine, Bristol vertical.
Grinder, No. 1 Norton, t. & c. r.	Shaper, 15" Potter & Johnston.
Grinder, No. 2 Norton, t. & c.	Shaper, 20" Walcott.
Grinder, No. 3 Morse plain.	

FOR SALE BY

Anson W. Richards, **802 Singer Building, New York City**

The following offers are bargains:

Automatics, 4" Gridley single spindle, good condition, (17).
Bulldozer, No. 25 Williams & White, 20" stroke, new.
Drill, 12-spindle multiple No. 12 Pratt & Whitney, 1 1/2" spindles, like new.
Screw machines, No. 4 Warner & Swasey, wire feed, like new, (32).
Slotter, 60" Newton complete with 220 volt motor, d. c.; now operating; fine condition.

WANTED TO BUY

We are in the market for a Brown & Sharpe Automatic Screw Machine, No. 00 or No. 0 or No. 2.

SECOND-HAND MACHINERY

FOR SALE BY

Harris Brothers Company, - 1475 W. 35th St., Chicago, Ill.

ENGINE LATHES.

Screw-cutting quick change mechanism, 3-step cone, dbl. bk. grd., comp. rests:
 18"x 6' Ryerson, (4). | 20"x10' Canada Machy. Corp., (5).
 With turrets on carriage with compound rests:
 18"x 6' Canada Machy. Corp., (2). | 20"x 8' McDougall, (3).
 With loose change gears, 3-step cones, dbl. back grd., and compound rests:
 18"x 8' Sidney, (3). | 18"x 8' Milwaukee, (6).
 With loose change gears, compound rests, single back geared:
 16"x 6' Cincinnati. | 21"x 7' Bertram.
 16"x 8' Barker, (4). | 16" Wells speed lathes, (10).
 16"x 6' Giddings & Lewis, (4).
 Plain turning lathes with plain rests. (Not screw cutting):
 16"x 6' Rockford, pan bed, (10). | 20"x 8' Simplex, (4).
 With turret on carriage but without plain rest:
 18"x 8' Milwaukee, (10).
 All the above lathes have hollow spindles and countershafts.

DRILL PRESSES.

Colburn 25" swing, heavy duty, high speed, No. 5 Morse taper, single pulley drive, (9).
 Barr 2-spindle 14" sensitive, capacity $\frac{1}{2}$ ".

GRINDERS.

Wells Bros. cutter and reamer. | 12x60" Brown & Sharpe No. 4 universal cylindrical grinder.
 Ford Smith cylindrical grinders, (2).
 $\frac{1}{2}$ h. p. Electric grinders, (5).

TURRET LATHES.

Jones & L. 3"x36" bar outfit, (3). | W. P. Davis 24" swing set over turret, all power feeds, (2).
 Warner & Swasey No. 4, 16" swing.

MILLING MACHINES.

Hendey Lincoln type Millers with quick change feed, 20" automatic feed to table, (25).
 Rockford No. 1 $\frac{1}{2}$ plain table, 38"x9".
 No. 6, 48" swing vertical Becker, latest type, improved standard miller, all power feeds, longitudinal 62"; transverse 20"; vertical 20"; power down feed to spindle head, 12" power feed to rotary.

HACK SAWS.

Racine high speed, 6" capacity. | Peerless high speed, 6"x6".

PUNCH PRESSES.

Williams straight sided, b. grd., sgl. action punch press, 22" between uprights.

HAMMERS.

Board lift drop hammers, 1000 lb., (2). | 6,000 lb. Chambersburg steam hammer, brand new.
 Board lift drop hammers, 2000 lb., (2).

PUNCHES AND SHEARS.

Long & Allstatter combination shear and beveling mche., wt. about 25,000 lb.
 Alligator shear for 14"
 Wiener steel plate "I" beam shear for 15" "I" beam.
 Thompson bevel cutting shear, $\frac{1}{2}$ " plate.
 Hilles & Jones sgl. end punch, 8" throat, architectural jaw, cap. $\frac{1}{4}$ " thru $\frac{3}{4}$ ".

TRAVELING CRANE.

Niles electric traveling crane, 46' span, 15 ton cap., with auxiliary hoist, 5 ton, 4 motor type, 220 d. c.

1000 lbs. of Stellite and Red Cut High Speed Steel.

Our complete Machinery Bulletin sent upon request.

SECOND-HAND MACHINERY

FOR SALE BY

Russell Machine Co., Inc., 28th St. & A. V. R. R., Pittsburgh, Pa.

LATHES.

- | | |
|-----------------------------------|--|
| 48"x16" bed lathe, compound rest. | 20"x8'6" Walcott, q. c. g., (3). |
| 48" Niles car wheel, m. d. | 19"x10' LeBlond, motor drive. |
| 38"x25' New Haven, raised to 56". | 19"x 8' LeBlond, q. c. g., heavy duty. |
| 38"x18' Pond, triple geared. | 18"x 8' Mueller, q. c. g., heavy duty. |
| 30"x14' Marshall & Huschart. | 16"x 6' Prentice, h. s. |
| 27"x18' American. | 15"x 6' Von Wyck, compound rest. |
| 27"x12' Pittsburgh, dbl. b. g. | 9"x40" Barnes, foot power. |
| 26"x10' Draper, triple geared. | 16"x 5' Gage brass finishers' turret. |
| 26"x10'6" Walcott, q. c. g. | 14"x 5' American speed lathe. |
| 24"x16' 6" Johnson lathe. | 24"x11' American semi-auto. turret. |
| 24"x12' Dietz, Schumacher & Boye. | 14"x 5' Fox brass lathe. |
| 20"x10' Mueller, h. s., c. r. | Speed lathes, various sizes. (10). |

PLANERS AND SHAPERS.

- | | |
|------------------------------------|---------------------------------|
| 27"x27"x8' planer, 1 head. | 16" Steptoe s. g. crank shaper. |
| 30"x30"x9' Sellers, 1 head. | 17" Economy s. g. crank shaper. |
| 36"x36"x12' Pond, three heads. | 24" G. & E. b. g. crank shaper. |
| 72"x56"x12' Betts planer, 2 heads. | 32" G. & E. b. g. crank shaper. |

DRILLS AND BORING MILLS.

- | | |
|---|--|
| Burke sensitive bench Nos. 0 & 1. | 24" New Haven plain drill. |
| 14" Rockford sensitive drill. | 38" & 40" New Haven drills. |
| No. 22 Silver post drill. | 44" Bickford radial, box table. |
| No. 3 Prentice port. rope drive drills. | Garvin 4 spindle drill press. |
| 20" Silver, new, plain and bk. gd. | 48" Niles car wheel boring mill. |
| 20" Foote-Burt mfrs. vertical. | 42" Colburn vertical boring mill. |
| 20" Barnes plain drill. | 60 & 76" Bullard vertical bor'g mills. |
| 20" Hoefler drill, bk. gd. | 72" Niles & Pond vert. bor'g mills. |

HAMMERS AND MILLERS.

- | | |
|------------------------------------|-----------------------------------|
| 1500 lb. double leg steam drop. | Little Giant 50 lb. power hammer. |
| 1500 lb. single leg steam forging. | No. 0 Owen plain miller. |
| Bradley cushion helves, 40 lb. | No. 1 U. S. Improved hand miller. |

ENGINES AND BOILERS.

- | | |
|--------------------------------------|---------------------------------------|
| 50 k. w. American steam elect. unit. | 50 h. p. White-Middleton gas engine. |
| 4 h. p. Fowler vertical gas engine. | 50 h. p. vert. submerged tub. boiler. |
| 40 h. p. Backus horiz. gas engine. | 6 h. p. vertical single flue boiler. |

PUNCHES, SHEARS, PRESSES AND ROLLS.

- | | |
|--|---|
| 50" throat Reade sgl. end punch and shear; massive construction. | Perkins No. 2 rotary shear, 12" thr. |
| 18" throat Rees s. e. punch. | No. 3-A R. & K. inc. presses, 2 1/2" str. |
| 18" throat Rees s. e. shear. | No. 56 dbl. housing knuckle press. |
| No. 6 L. & A. s. e. punch. | No. DG-76 Ferracute single acting. |
| No. 8 L. & A. geared s. e. punch. | Straight-side punch press, 1 1/2" str. |
| 3 1/2" throat, punching cap. 1 1/2" x 1 1/2". | No. 4 Stevenson foot pwr., 6" thrt. |
| 48"x1 1/2" Wais & Roos sq. shear. | 60"x1 1/2" hand power rolls. |
| | Toledo No. 365 gap rolling mill. |

MISCELLANEOUS.

- | | |
|--|--|
| Air compressor, No. 0 Au-To 3"x4". | Grinder, 10" dbl. e. emery, on column. |
| Air compressor, s. cyl. 3x5", belted. | Grinder, Russell 12" dbl. end bench. |
| Air compressor, double cyl. 2 1/2"x4". | Grinder, No. 2 Woods universal tool. |
| Air compressor, 6x6 Laidlaw hor. | Grinder, Barnes 20" wet tool. |
| Bender, Wallace No. 11 angle, hd. pr. | Grinder, 20" Ransom w.t., 250 v. d.c. |
| Bender, Hinman No. 1 Eye, hd. pr. | Grinder, Cincinnati tool and cutter. |
| Blower, Root No. 3 Acme, hand. | Grinders, Landis 26x96; Cinti t. & c. |
| Blower, pressure. No. 3 Sturtevant. | Grinder, twist drill, cap. to 2 1/2". |
| Blower, Buffalo No. 10, pressure. | Metal lockers, 10 sections. |
| Bolt cutter, 3" Acme, single head. | Motors, various types, 2 to 40 h. p. |
| Brazing table, all iron, 17"x29"x31". | Pipe machine, E. C. & B. 2 1/2" to 8", |
| Centering mch., Whiton 6" sgl. spdl. | steam engine driven. |
| Chain belt, 16"x8"x1 1/2" p. and gear. | Poli-hing stand, Diamond No. 2. |
| Cold saw, Newton, 20" dia., 5 1/2" rd. | Polishing stand, d. end, 42"x1 1/2" arbor. |
| Crane, 10" I-beam, 12'3" span, with | Polishing stand, Cuyahoga dbl. end. |
| Harrington 6,000 lb. chain hoist. | Slotter, 24" Dill, new. |
| Cutting-off mch., Hurlburt R. 4". | Tapping machine, No. 2 Garvin. |
| Grinder, Western No. 10. | Vices, Forges, Pumps, Tanks. |

SECOND-HAND MACHINERY

FOR SALE BY

Cyril J. Bath & Co.,

721 St. Clair Ave., N. E., Cleveland, O.

Selections from Stock.

AUTOMATICS.

- 5A and 6A Potter & Johnston automatics, 75% new.
24" and 44" Model A Cleveland automatics, with large equipment, 75%.
24" 4-spindle Gridley automatic, standard equipment, 85%.
No. 33 New Britain auto. chucking mchs., 5 stations and tapping spdl., handle work up to 24" dia. in chuck jaws and 54" swing outside chucks, 70%, (3).
No. 24 New Britain automatics, late model, 85%, (2).

BAR STOCK MACHINES.

- No. 4 Warner & Swasey screw machines, power feed to turret, 85%, (2).
No. 6 Warner & Swasey screw machines, power feed to turret, 85%, (2).
2" P. & W. screw machine, with toolholders, 70%.
3" P. & W. screw machine, with toolholders, 70%.

BORING MILLS.

- 30" Colburn vertical single turret head, arranged for thread cutting, 80%.
24" Bullard vertical turret lathe, side head, 80%.

BULLDOZER.

- No. 5 Ajax hi-speed bulldozer, with steel bed and cut gears; stroke 14", cross-head 9"x44", 6" shaft, weight 26,000 lbs.
No. 3 Williams & White bulldozer, 90%.

DRILLING MACHINES.

- 20", 22", 24" and 28" Sibley drill presses, new.
2-spindle 24" Barnes all geared drill, pump and piping, one spindle with tapping attachment, 85%.
20" Sibley & Ware drill presses, hand wheel and lever feed, 75%, (3).
22" Rockford drill press, hand lever feed, 75%.
24" Cincinnati-Bickford, sliding head, complete, very good, 75%.
Large Colburn D-3 hi-speed drills; very good condition, 80%, (2).
No. 22 Natco multiple drills, 16"x20" head, rotary table, 90%, (2).

GEAR CUTTERS.

- 26" No. 3 Brown & Sharpe plain gear cutter, with all parts, 85%.
36" Fellows gear shapers, 75%, (6).
26" Cincinnati late model gear cutters, 85%, (2).
40" Flather plain spur gear cutters, 80%, (2).
B. & S. gear testers, 90%, (3).

GRINDERS.

- Cincinnati No. 1 old style cutter grinder, complete, 50%.
No. 1 Brown & Sharpe universal grinder and parts, 80%.
No. 2 Woods tool and cutter grinders, 95%, (2).
Wet and dry Yankee drill grinders, 100%.
18" Bryant internal grinder, late model, 75%.
No. 60 Heald cylinder grinder, 75%.
No. 8 Besly disc grinder, 70%.
No. 4 Gardiner disc grinder, motor driven, 85%.

HAMMER.

- 100 lb. Mayer, belt drive, regular equipment, 100%, new.

LATHES.

- Small speed lathe, 10"x5', good.
14"x 6" Lodge & Shipley, taper attachment, 80%.
14"x 6" Hendey lathes, draw-in collet and 4-jaw chuck, 85%, (2).
16"x 6" Hendey lathe, 4-jaw chuck, 85%.
20"x10' Boye & Emmes, quick change gears, 80%.
24"x14' Boye & Emmes, quick change gears, 70%.

MILLING MACHINES.

- Billings & Spencer die trimming improved miller, 70%.
No. 60 Brown & Sharpe plain hand miller, 65%.
No. 3-B Brown & Sharpe heavy hi-power, 80%, range 34"x12"x20".

PLANERS.

- 36"x36"x14' Pond, single head, in good condition, with table 6" thick, no broken T slots or pegged gears, a good rugged tool, 70%.
36"x36"x16' Hewes & Phillips, 2 new swivel heads, new gears, rebuilt throughout by Planer Co., 90%.

SECOND-HAND MACHINERY

Cyril J. Bath & Co.—Continued.

PRESSES.

- No. 27 Bliss embossing presses, 2" stroke, width of bed 32", 1000 tons approximate capacity, 80%, (2).
 No. 59 Toledo crank presses, d. b. g., 18 or 10" stroke, friction clutch, 80%, (3).
 No. 57 Toledo crank presses, double back geared, 80%, (2).
 No. 77½ Bliss crank presses, dbl. bk. grd.; can also supply 10" stroke; 80%, (2).
 No. 87 Bliss crank presses, double back geared, 80%, (2).
 No. 60½ Bliss rack and pinion drawing press, 80%.
 No. 60½ Bliss rack and pinion drawing presses, 80%, (13).
 No. 2W Bliss tapering presses, geared, 80%, (5).

SAWS.

- No. 4 Cochrane & Bly cut-off sawing machine and grinder 75%.
 11½" Higley bolt cut-off saw, 14" blade, 60%.
 Higley billet saws, 33" blades, arranged for motor drive, 70%, (4).
 Metal band saws, 60% (2).
 Peerless hi-speed 6" saws, 100% new, (3).

SHAPER.

- 24" Juengst horizontal crank shaper, worm gear drive, 60%.

TURRET LATHES.

- 3½x36 Acme flat turret lathes, with chucking equipment 85% (2).
 2½x24 Acme flat turret lathes, with chucking equipment, 85%, (2).
 3x36 J. & L. flat turret lathe, with bar and chucking equipment, 80%.
 No. 2 W. & S. hollow hex. turret lathe, roller feed, bar and chucking equip., 70%.
 2"x36" Pratt & Whitney, chucking equipment, 80%.
 3" P. & W. screw machine, power feed to turret, cross slide tools, etc., 80%.

MISCELLANEOUS.

- Annealing furnaces, 25'x8' Rockford, double door (5).
 Annealing furnace, 16'x8' Rockford, double door
 Above equipped with oil and gas burners, recording and indicating pyrometers, air rams and pulleys.
 Broaching machines, 2-spindle LaPointe No. 3, 85%, (2).
 Drilling machine, 2-way Garvin No. ISS, 85%.
 Return roller, No. 6 Ajax, 75%.
 Tapping machine, No. 2 Garvin automatic, 95%.

SPECIAL.

- Steam Forging Hammer, 6-ton Morgan, 84" stroke, 26" cylinder, 8" rod, double frame, 90% condition, weight 300,000 lbs. approximately.

FOR SALE BY

E. L. Essley Machinery Co., 551-557 Washington Blvd., Chicago, Ill.

DRILL PRESSES.

- 5' Niles full universal radial.
 No. ½ Avey single spindle.

GRINDERS.

- No. 1 Cincinnati, universal.
 No. 190 Wells cutter and reamer.

LATHES.

- 11"x 6' Star, draw-in att. turret on shears.
 16"x 8' Von Wyck, taper att.
 17"x 8' LeBlond heavy duty.
 18"x 8' Bradford, q. c. g., taper att.

SCREW MACHINES.

- 8" & ¾" Cleveland full auto.
 No. 5 Pearson, hand, fric. head.
 1"x15" Pratt & Whitney, plain head.

MISCELLANEOUS.

- Boring mach., No. 0 Fosdick.
 Broaching machine, No. 3 Lapointe.
 Cold saw, No. 14 Higley.
 Gear cutter, No. 3 B. & S. auto.
 Grinder, disc, 18" No. 6 Besly, dbl. sp.
 Miller, hand, No. 2 P. & W.

- 20"-4 spindle Barnes all geared gang.
 No. 2-D 24" Minster, heavy duty.
 No. 1 Norton univ. cutter & reamer.
 No. 2 10"x32" Ott universal.
 20"x 8' Hamilton.
 22"x12' Greaves & Klusman.
 24"x12' Prentice Bros.
 36"x14' Bradford.

- No. 3 Foster, plain head (7).
 No. 4 Foster, plain head (5).
 ½" Smurr & Kamen, plain head.

- Miller, No. 2½ Hendey, Lincoln type.
 Planer, 26"x22"x6' Gleason.
 Planer, 32"x32"x12' Davis & Egan.
 Planer, 42"x42"x8' Whitcomb.
 Punch, Sellers single end, 26" thr.
 Turret lathe, 2"x24" J. & L.

SECOND-HAND MACHINERY

FOR SALE BY

Federal Machinery Sales Company,
8 N. Jefferson St., Chicago, Ill. 208 Sycamore St., Milwaukee, Wis.

First-Class Bargains.

DRILLING MACHINES.

New 36" Cleveland, b. g., p. f.
 New 36" Mueller plain radial, gear box drive.

GEAR CUTTERS.

Used No. 1 and No. 2 Adams gear hobbors.
 Used 26" and 36" Brown & Sharpe spur gear cutters.

GRINDERS.

New No. 1 Grand Rapids cutter and tool grinder.
 Used Landis 12"x36" plain grinder.
 Used Springfield universal gauge grinder, with motor.

LATHES.

Used 14"x24" gap x 5' bed Barnes sliding bed gap lathe.
 Used Porter-Cable manufacturing lathes, (3).

MISCELLANEOUS.

Pipe machines, 4" Victor, used.
 Screw machine, 1" Foster, used.
 Turret lathe, 20"x8" Bridgeport, used.

FOR SALE BY

The E. A. Kinsey Co., Cincinnati, Ohio, Indianapolis, Indiana

DRILLING MACHINES.

3' Fosdick radial drill.
 1/2" type BA-1 U. S. Electric, 220 volts, 60 cycle, 3 phase.
 1/2" type T., U. S. Elect. 220 v., 60 cy.
 Bausch 4-spindle multiple.

GRINDERS.

16x36 Queen City plain.
 Brown & Sharpe plain, universal table, capacity 18"x10".
 No. 2 Cincinnati univ., complete.
 14" J. C. Blount wet tool.
 Norton No. 1 universal grinder.
 Water tool, 26 in. wheel.
 Wesche electric buffing, a. c. motor.

LATHES.

14x 6' Monarch, d. b. g., c. r.
 16"x 8' Seneca Falls, q. c.
 19"x10' Greaves-K., c. r., s. & f. r.
 20"x8' Fay & Scott, hex. turret on shears.
 20x10' Bradford, 2 c., c. r.

PLANERS.

32"x32"x8' New Haven.
 18' Niles-B.-P. plate, 1/2" steel plate.
 54-54x30 H. P. Betts; rev. d. c. motor.

TURRET AND SCREW MACHINES.

No. 1 Am. Tool & M. Co., sq. ar., s. b. g., 4 s. c.
 3x36 Jones & Lamson flat turret.
 No. 2 Warner & Swasey, (2).
 No. 2 Garvin, w. f., power feed turret, automatic chucks.

MILLING MACHINES.

No. 3-B heavy milling machine.
 LeBlond No. 24 h. d. plain.
 48" Newton plain.
 No. 6 Whitney hand miller.

MISCELLANEOUS.

Abrasive metal cutter, 12" Peters.
 Band saw, 36" Towsley, with motor.
 Bolt cutter, 24" Acme, dbl. spindle.
 Boring mill, Pond vertical, 8' table, 11' between uprights.
 Centering att., Carrol No. 2, cap. to 2".
 Chain machine, Cross & Spliers.
 Chuck, 12" universal.
 Cutting-off mch. 3" Hurlbut-Rogers.
 Gas furnace, No. 93 Stewart dbl. end.
 Gear cutter, 26" No. 3.
 Gear hobber, 18" Gould & Eberhardt.
 Gear hobber, No. 3 Farwell.
 Hammer, Bement-M. 1500 lb., steam.
 Oil pump, Trahern No. 1 F. rotary.
 Profiler, Pratt & W. No. 12, belt.
 Riveter, 3-16" Schuster on ped.
 Saw bench, Beach, table, 36x54".
 Special internal grinding fixture.
 Brown & S., for No. 1 universal.
 Tapping machine, Garvin No. 1.
 Vise, flanged, Brown & Sharpe No. 4.

SECOND-HAND MACHINERY.

FOR SALE BY

David A. Wright, 568 Washington Blvd., Chicago, Ill.

In Stock—Immediate Shipment.

AIR COMPRESSORS.

Curtis, Gardner and Ingersoll—All sizes.....Application

BLOCKS, CHAIN.

All sizes.....Application

BLOWERS.

No. 5 Root, foundry blowers, (2) \$400, No. 6 Root.....\$ 850.

CENTERING MACHINE.

4½"x55" D. E. Whiton, condition 80%.....\$ 100.

DRILLING MACHINES

No. 3 White sens., cond. 85%.....\$ 45.00

No. 50 Champion b'ch., new (2).....32.50

Garvin old style, 4-spd.....40 00

Garvin old style, 6-spd.....50 00

Dumore Electric, (20).....Application

14" U. S. Sensitive.....\$ 55.00

14" Champion upright, new (2).....90.00

18" Milwaukee, cond. 80%.....75 00

20" Silver, back grd., (6).....155.00

20" Aurora, b g., pwr. fd., 95%.....700.00

No. 32-D DeMooy 2-sp., new.....400.00

36" Radial drill, cond. 70%.....300 00

½" No. 1 Avey sgl. sp., 95%, (6).....\$ 125.00

8-spd. Western.....1500.00

8-sp. Baush No. 857, table, 90%.....1600.00

8-sp. Baush, cond. 90%.....1600.00

14-sp. Baush, cond. 85%.....2200.00

42" Machine Tool Works

radial No. 7A, cond. 75%.....500.00

4" Mch. Tool Wks. radial, 75%.....500.00

4" Cincinnati radial, cond. 80%.....750.00

4" radials, plain, new, (7).....2200.00

4" Bickford radial, cond. 90%.....900.00

5" Bickford radial, cond. 95%.....1800.00

ENGINES

50 h.p. 12x12 Watertown.....\$2000. 60 h.p. 10x16 Atlas, cond. 90%.....\$ 600.

EYE BENDER

Williams & White heavy type eye bender, condition, 90%.....\$ 900.

GRINDERS.

No. 1 LaSalle pl. & sur., new, (2).....\$ 95.

No. 5 Diamond, cond. 85%, (2).....160.

Roth dbl. end grinder & buffer,

direct connected to motor.....325.

Premier univ. tool & cutter, new.....\$ 540.

12x30 Fitchburg pl. cyl. No. 475.....1400.

No. 1 Webster & Perks, new.....1675.

No. 3 Modern universal, new, 1850.

HAMMER.

No. 201 David Bell Steam Hammer, condition 90%.....\$ 500.

HEATER.

No. 8-0-1 Webster Vacuum Heater, condition 95%.....\$ 700.

LATHES.

12"x5' Mulliner-E. tool room,

new, (2).....\$1150.

14"x6' Filsmith, q. c., d. b. g.,

new, (3).....666.

Dalton 6, 30" bed, new, (2).....\$ 280.

15"x8' Sebastian gap, new, (3).....550.

No. 2 Niles dbl. axle lathe, comp. 1200.

52" Niles tire lathe, cond. 95%.....3500.

Fifield Lathes, prices on application, as follows:

50x20 and 50x32 cone type; 50 by any length bed; 60x24, 60x25 and 60x30 either

motor or cone drive; 96x24 and 96x30 cone drive.

LOCOMOTIVES.

60-ton standard gauge complete, condition 90%, (18), each.....\$16,000.

MILLING MACHINES.

Simplex bench, new, (2).....\$ 200.

Pratt & Wright Simplex, c. s.,.....200.

No. 1 Bickford hand, new, (2).....350.

Pratt & Whitney Lincoln, used.....400.

No. 4 Garvin hand, vertical fd. 160

Kempsmith, Lincoln, cond. 97%.....\$ 650.

No. 3 Kempsmith pl., cond. 95%.....1800.

No. 3 Kempsmith universal.....1900.

No. 3 Kempsmith plain, all

feeds, new.....1950.

PLANERS.

24" Lane endless bed, c. s., new.....\$ 400.

24"x24"x 6' Lodge & Davis, 2

heads, condition 95%.....1100

24"x24"x 4' Gray No. 3.....\$ 755.

42"x48"x11' Gray, cond. 90%.....4000.

48"x48"x30' Putnam, cond. 90%.....10000.

SCREW MACHINES.

No. 1 Foster, (3) \$200; with w. f.,

turret slide and saddle.....\$ 350.

3" Cleveland auto., cond. 90%.....400.

4-spindle National Acme.....500

No. 3 Foster hand, (3).....600.

No. 3 Federal 1 ½/16", new, (2).....800.

No. 5 Foster, cond. 95%, (9).....\$ 650.

No. 4 Foster 1-5/16", condi-

tion 95%, (4).....550.

8" to 3" Cleveland Acme, (3).....675.

No. 10 Foster, cond. 95%, (7).....900.

3" Cleveland full auto., (15).....1600.

SHAPERS.

14" Hendey, geared.....\$ 275.

14" Steptoe, condition 90%.....350.

20" Queen City, new.....\$1215.

24" Queen City, new.....1515.

SECOND-HAND MACHINERY

FOR SALE BY

Girard Machine & Tool Co., 491-493 N. Third St., Philadelphia, Pa.

Engine lathe, 28"x12' Fitchburg, double back geared, 7' between centers.
 Engine lathes, 26"x13' Wickes, double back geared, heavy duty, q. c. (2).
 Engine lathes, 26"x10' Bridgeport, d. b. g., q. c., 4' centers (2).
 Engine lathe, 21"x11' Lodge & Davis, taper attachment, 7' centers.
 Engine lathes, 20" x 8' Lodge and Shipley, d. b. g., q. c., 4' centers. (2).
 Engine lathe, 18"x8' Lodge & Shipley d. b. g., q. c., tap. att., 4' centers.
 Engine lathes, 18" x 6' American, d. b. g., q. c., heavy duty, (12).
 Engine lathe, 18" x 8' Milwaukee, d. b. g., q. c., heavy duty.
 Engine lathes, 17"x6' LeBlond, d. b. g., q. c., heavy duty, (10).
 Lathes, 12", 14" and 16" quick change, with various size beds.
 Grinder, No. 1 Cincinnati, univ. cutter and reamer, standard equipment.
 Grinder, No. 2 Bath universal cutter and reamer, with standard equipment.
 Grinder, No. 2 Brown & Sharpe universal cutter & reamer, standard equip.
 Planer, 40"x40"x8' Bement, two swiveling heads.
 Planer, 24"x24"x8' Pond planer, one head.
 Shapers, 20" Kelly, 16" Gould & Eberhardt, 24" Barker, b. g., late type.
 Turret lathes, 2x24 Jones & Lamson, bar equipment; 21" and 23" Gisholt.
 Large lot of Screw Machines, Drill Presses, Punch Presses, etc.

Send for our List.

FOR SALE BY

A. D. White Machinery Co., 108-114 N. Jefferson St., Chicago

ENGINE LATHES.

16"x12' Beaman & Smith.	24"x10' Putnam.
18"x 7' Chard, d. b. g., p. c.	28"x 8' Prentice, d. b. g., p. c.
18"x 8' Bell, d. b. g., p. c.	28"x25' Blaisdell.
18"x10' Reed.	30"x10' Pond.
20"x 8' Reed.	34"x10' Putnam.
20"x 8' Boye-Emmes, d. b. g., q. c.	38"x14' Fifield.
22"x10' Davis, d. b. g., q. c., (3).	

MILLING MACHINES.

No. 1 Burke bench millers, (4).	Model AB Becker, vertical.
No. 25 Becker plain, (3).	No. 5-B Becker vertical, (2).
No. 1-Y Brown & Sharpe.	Newton slab, table 15"x65"
No. 6 Brainard, Lincoln.	Newton slab, table 15"x36"

TURRET LATHES AND SCREW MACHINES.

No. 3 Foster, plain head.	No. 1 Garvin, hand, (9).
20"x5' Bridgeport, (2).	No. 3 Stecher, hand, (6).
20"x8' Fay & Scott universal.	7/16" Cleveland, ratchet feed.
22"x5' Reed.	1" Cleveland, semi-auto.
21" Gisholt.	1" Cleveland, friction.
24" Gisholt, big bore.	1 1/2" Cleveland, friction.
24"x26" Greenlee.	1 1/2" Cleveland, jigger.
3x26" Jones & Lamson.	1" Hartford, (2).
16"x5' Dreses Fox Monitor.	1" Cleveland, jigger.
18"x6" American Fox monitor.	1 1/2" LaVigne.
18"x6" Springfield Fox monitor.	

DRILL PRESSES.

25" Bickford, sliding head.	36" Mueller plain radial.
42" W. F. & John Barnes, slid hd.	42" Miles plain radial.

PUNCHES AND SHEARS.

10" throat geared punch.	Rock River, d. e. 24" thrs., cap. 4".
No. 6 L. & A., 4" throat cap. 1/2".	No. 37 Williams & W. gang punch.

MISCELLANEOUS.

Bolt cutter, 1 1/2" double hd., Adams.	Hammer, 500-lb. Sandage.
Blower, No. 7 Sturtevant high press.	Oil gas generator, No. 3 American.
Gas engine, 35 h. p. Columbus.	Rivet spinner, Grant, 5/16".
Gas engine, 55 h. p. Bruce McBeth.	Saw, No. 5 1/2 Nutter-Barnes.
Grinders, No. 2 Woods tool & cutter	Shaper, 16" Gould & Eberhardt.
Grinder, Springfield, 3-wheel water.	Tapper, No. 1 Garvin automatic.
Grinder, Leland & F., water.	Tube cutter, No. 3 Fox.

SECOND-HAND MACHINERY

FOR SALE BY

Brown-McDonald Machinery Co., 2323 N. 9th St., St. Louis, Mo.

BORING MILLS.

48" Bullard, vert., 1 plain & 1 swivel hd. on cross rail, face plate jaws, used.
42" Bullard, vertical, 2 swivel heads, 1 turret, 1 plain, used.

LATHES.

13"x 6' South Bend, c. r., h. s., new.	20"x10' Walcott, q. c. g., d. b. g., c. r., h. s., new.
15"x 8' South Bend, c. r., h. s., new.	20"x10' Walcott & Wood, h. s., cpd r., used.
16"x 8' South Bend, c. r., h. s., new.	14"x 6' Fitchburg, s. s., p. r., used.
16"x 8' Walcott, q. c. g., d. b. g., c. r., h. s., new.	
16"x 8' American, q. c. g., used.	

DRILLING MACHINES.

No. 1 Burke, bench, with chucks, new.	34' No. 101 C-O. radial new.
Avey, high speed bench.	20" Silver, s. b., w. & l., new.
Demco, high speed, bench, used.	20" Silver, s. b., b. g., p. f., new.
14" Excelsior, 2 tables, new.	20" Champion, s. b., w. & l., new.
4" Leland Gifford, high speed, with pump.	20" Champion, s. b., b. g. & p. f., new.
	26" Aurora, b. g., p. f., new.
	30" Prentice, s. b., s. h., p. f., used.

SHAPERS.

16" Whipp, single gear, new.	24" Gould & Eberhardt, used.
20" Milwaukee, b. g., latest imp., new.	Rhodes Nos. 1 and 3 horizontal and vertical, new.
18" & 24" Hollingsworth, new.	

SCREW MACHINES.

No. 4 Smurr & Kamen, geared friction head, p. f. to turret, new.
No. 4 Defiance, geared friction head, p. f. to turret, used.
No. 53 National Acme automatic, used.
No. 52 National Acme automatic, used.
Wood Tilted Turret 1 1/2", used.

MILLING MACHINES.

No. 2 American Lincoln, b. g., new.
No. 1 U. S. hand, vise and arbor, new.
No. 2 Pratt & Whitney, Lincoln type, used.
No. OY Brown & Sharpe, used.

PRESSES.

No. 1 Loshbough-Jordan, o. b. i., new.	No. 3 Kohler, o. b. i., used.
No. 3 Loshbough-J., o. b. i., new.	No. 1 Greenerd, arbor, used, (9).
No. 4 Loshbough-J., o. b. i., new.	No. 2 Greenerd, arbor, used, (6).

SAWS.

Nos. 1 & 2 Marvel, draw cut, new.	Williamson, metal, used.
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GRINDERS.

Nos. 1, 2 & 3 Western, d. e., new.	Essley, cylindrical.
Nos. 1, 2 & 3 St. Louis, d. e., new.	No. 190 Wells, reamer & cutter, new.
No. 20 Safety E. W. Co., elec. (4).	Greenfield univ. tool & cutter, new.
U. S., electric, 110 v., d. e., bench.	Nos. 1 and 2 American, surface, new.

COMPRESSORS.

Nos. 2, 3 & 4 Model B, vertical, belted, new.
Curtis 8x8 double cylinder, belt drive, (2).

MISCELLANEOUS.

Bolt threader, No. 734 Greenfield, new.	Pipe cutter, B. & K., 4" cap.
Filing mchs. No. 2 Cochran-B. used.	Pipe mch., No. 86 Forbes, 4", used.
Motor, 5 h. p. General Electric, 3 ph., new.	Pipe machine, No. 76 Forbes, 3", used.
Motor, 10 h. p. General Electric, 3 ph., new.	Pipe machine, 3" Borden, hand.
Motor, 1 h. p. Advance, sgl. ph., new.	Planer, 36"x36"x15' Patch, o. s., 1 hd. on cross rail, 1 head on side, used.
	Large stock of tinnerns' tools.

CHUCKS.

5" & 9" 2-jaw Sweetland, scroll, new.	No. 18 National Acme, s. o., die hd.
6-12-14-16" 4-jaw Sweetland, independent, new.	5", 6", 7 1/2", 9" 2-jaw Cushman, universal, used.

SECOND-HAND MACHINERY

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1001-3-5 N. Sixth St.,

St. Louis, Mo.

LATHES.

17"x 6' Oliver quick change.
18"x 8' Rockford, quick change.
20"x 8' Lodge & Shipley all g. h.

21"x10' LeBlond, q. c., heavy duty.

26"x10' Bridgeford quick change.

28"x16' Long & Davis.

PLANERS.

26"x26"x5' Pease.

30"x30"x6' Putnam.

30"x30"x8' Hewes & Phillips.

36"x36"x8' Gray.

DRILLING MACHINES.

26" Baker Bros.

40" Bement gooseneck drill.

42" Drees heavy duty.

MILLING MACHINES.

No. 3 1/2 Fox.

No. 3 Owen, with dividing head.

No. 3 LeBlond plain, with dividing head.

GRINDERS.

12"x24" Modern plain.

14"x36" Landis universal.

MISCELLANEOUS

Blower, No. 3 Root.

Bolt header, 1 1/2" Blakeslee.

Brake, 8' steel, No. 15 capacity.

Brake, 10' steel, No. 16 capacity.

Bulldozer, No. 3 Fisher.

Gear cutter, 36" Cincinnati.

Grinder, No. 38 plowshare.

Hammer, steam, 1100 lb.

Numbering machine, Noble & W.

Press, inclinable, No. 6 Niagara.

Press, arch, No. 40 Swaine.

Punch & sh. No. 1 L. & A., 24" tht.

Screw machine, P. & W., hand, 2".

Screw machines, Warner & Swasey,

hand, 2".

Shear, alligator, No. 2 Doelger &

Kirsten.

Turret lathe, 3x36 Jones & Lamson.

FOR SALE BY

McCoy-Brandt Machinery Company

Office and Warehouse, 210-218 Penn Ave., Pittsburgh, Pa.

DRILLING MACHINES.

8-spindle gang, Foote-Burt.

4-sp. gang, Bickford, cap. 2" holes.

No. 310 Baker, heavy duty, cap. 2 1/2".

24" Colburn heavy duty.

28" and 24" back geared, power fd.

24" Barnes, plain, sliding head.

LATHES.

72"x31' 6" Fifield, triple geared.

48" car wheel turning, m. d.

24"x12' S. B. & E., c. r., 18" chuck.

24" and 20"x10' LeBlond, q. c. g.

20"x 8' LeBlond, q. c. g., t. a.

18"x 8' American, geared head, t. a.

17"x 8' Sidney, q. c. g., d. b. g.

16"x 6' LeBlond, c. r., chuck.

14"x 6' Hendey, geared hd, q. c. g.

Speed lathes, 15" and 13", 4' bed.

PUNCHES, SHEARS AND ROLLS.

14" throat L. & A., dbl., cap. 2 1/2"x1 1/2".

36" throat Whiting, 1"x1", arch. jaw.

36" throat Cleveland, cap. 3"x3".

15" throat, double, capacity 1 1/2"x1",

No. 13 Williams-White.

50" throat, cap. 1 1/2"x1", Cincinnati.

Guillotine shear, cap. 1", 2" & 2 1/2".

Bevel shear, Thompson, rated cap. 3".

Slitting shear, rotary, 23" tht., cap. 3".

Squaring shear, 122", cap. 3-16".

Squaring sh., 26", cap. 16 ga., pwr.

Rolls, 10' Bertsch, cap. 14" gauge.

PLANERS, MILLERS AND SHAPERS.

30"x30"x10' Sellers, 1 head.

24"x24"x6' American, 1 head.

No. 2 Cleveland univ., near new.

No. 3 B. & S. univ., index head.

No. 3 Cincinnati plain.

20" Steptoe crank, geared.

24" Cincinnati, crank, back grd.

MISCELLANEOUS.

Hammers, steam, 600, 700, 1,000, 10,000 and 12,000 lbs. double frame.

Pipe machines, 4" and 8".

Presses, Ferracute Nos. DGG-55, DGG-56, D-201, D-301 and EG-6, all straight sided.

Presses, Ferracute Nos. E-56 and E-57, toggle.

Quick shipments from stock.

SECOND-HAND MACHINERY

FOR SALE BY

Stocker-Rumely-Wachs Co.,

117-121 N. Jefferson St., Chicago

In stock for immediate delivery.

BORING MILLS.

Industrial Works horizontal, 24" bar.

42" Gisholt, 1 plain and 1 turret head, chuck in table.

60" Bullard, 2 plain heads.

76" Bullard, 2 plain heads.

DRILLING MACHINES.

12" Leland Gifford, h. s., ball bearing, single spindle.

No. 1 Avey, h. s., ball bearing, single spindle.

Henry & Wright, h. s., ball bearing, single spindle, class B.

Henry & Wright, h. s., ball bearing, four spindle.

Henry & Wright, h. s., ball bearing, six spindle.

60" Bickford, back geared, power feed.

D4 Colburn heavy duty.

5' Fosdick radial drill.

6' Gang radial drill.

6' Prentice radial drill.

No. 11 Natco.

GEAR CUTTERS.

26" No. 3 Brown & Sharpe.

30"x8' Gould & Eberhardt.

No. 3 Farwell gear hobber.

8" Gleason automatic.

GRINDING MACHINES.

No. 1 LeBlond cutter and tool grinder.

No. 1 Cincinnati tool and cutter grinder.

No. 12 Brown & Sharpe universal grinder.

No. 1 Brown & Sharpe universal grinder.

6"x32" Norton grinder.

8"x40" Morse grinder.

No. 12 Modern grinder.

No. 10 Brown & Sharpe grinder.

No. 11 Brown & Sharpe grinder.

No. 10 Besly disc grinder.

LATHES.

Porter-Cable.

20"x10' Hamilton double back gear, compound rest.

24"x12' Schumacher & Boye, compound rest.

30"x12' Blaisdell, compound rest.

32"x18' Bradford, compound rest.

37"x18' Fifield, compound rest.

MILLING MACHINES.

No. 3 Burke hand miller.

No. 3 Rockford hand miller.

No. 0 Rockford plain miller.

No. 2 LeBlond plain miller.

Type "B" Briggs miller.

No. 4 Cincinnati vertical miller.

No. 5 Hendey, Lincoln type miller.

SCREW MACHINES.

No. 1 Pratt & Whitney, plain head, automatic chuck and wire feed.

No. 6 Foster, friction head, auto. chuck and wire feed, power feed to turret.

No. 9 Bardons & Oliver, friction head, a. c. and w. f., power feed to turret.

21" Gisholt turret lathe.

24" Gisholt turret lathe.

2"x24" Jones & Lamson turret lathe.

3"x36" Jones & Lamson turret lathe.

Potter & Johnston turret lathe.

MISCELLANEOUS.

Band saw, Fay & Egan, heavy duty.

Planer, 42"x50"x12' Gray, 2 heads.

Shop saw, No. 5 Marvel.

Slotter, 18" Canadian Machinery Corporation.

SECOND-HAND MACHINERY

FOR SALE BY

H. D. Warner,

57 May St., Hartford, Conn.

Annealing furnace, automatic rotary.
Automatic, 14" mult.spdle. Gridley.
Automatics, 34" sgl. sp. Gridley, (3).
Automatic, 14" Cleveland.
Automatics, 34" Cleveland, (2).
Automatics, 6" Cleveland, (2).
Automatics, No. 23 New Britain, (6).
Automatics, No. 5-A P. & J., (6).
Automatics, No. 6-A P. & J., (30).
Broaching mchs., No. 1 Lapointe, (5).
Drill presses, 2-spindle Allen ball-bearing, (5).
Drill press, 6-spindle Baker.
Drill press, 4-spindle Norton & Jones.
Drill press, Detroit horizontal.
Gear cutter, 24x10 Gould & E.
Gear hobber, 24x10 Gould & Eberhardt, spiral, spur and worm.

Hack saws, Atkins, (20).
Header, 1" Acme hot bolt.
Lathes, Porter-Cable, (4).
Millers, P. & W. Lincoln, (6).
Millers, Briggs type A, (6).
Milling machines, 12" P. & W. light automatic, (40).
Press, No. 55 Toledo, 1" stroke.
Presses, No. 60 Bliss.
Press, No. 77 Bliss, 20" stroke.
Profilers, P. & W. 2-spindle, (4).
Screw machine, No. 3 P. & W., hand.
Screw machine, No. 4 B. & O., hand.
Shear, alligator, to cut 14" square cold steel.
Spot welder, Toledo, 1/2" capacity.
Tote boxes, metal, 18"x10"x5" size, (10,000).

FOR SALE BY

Herman L. Winterer,

943-53 N. Front St., Philadelphia, Pa.

LATHES.

36"x22" Johnson, triple grd., q. c. g.
32"x12" Pittsburgh, d. b. g., q. c. g.
31"x14" Niles.
23 1/2"x26" Johnson.
20"x10" Niles, d. b. g., q. c. g., (2).
27"x12" Bridgeford, d. b. g., q. c. g., (2).
26"x11" Wickes, d. b. g., semi-q. c. g.
25"x14" LeBlond.
22"x10" Davis, d. b. g., q. c. g.

21"x10 9" Fitchburg.
22"x 8" Hamilton, d. b. g., semi-q. c. g., (2).
21 1/2"x8" LeBlond, (5).
20"x8 6" Walcott, d. b. g., q. c. g., (3).
19 1/2"x8 6" Lodge & Davis.
19"x10" Draper, patent head.
18"x 7" Chard, d. b. g., semi-q. c. g.
And many others.

TURRET LATHES.

22" Gisholt.
3"x36" Jones & Lamson.
7"x14" Potter & J. semi-auto., (2).

No. 4 Warner & Swasey, Fox attach.
And many others.

DRILL PRESSES.

6" Newton radial.
4" Niles radial.
40" Barnes horizontal radials, (2).
36" Bickford radials, circular base, motor driven, (2).

36" Drees radial.
25" Weigel.
30" Baker.
Plain drills, all sizes.
Drill presses, assorted sizes.

MILLING MACHINES.

No. 6 Becker vert., table 18"x60".
36"x8" Ingersoll horizontal.
No. 5 Cincinnati, table 9 1/2"x50 1/2".
No. 15 Garvin, table 12x14 1/2".
No. 15 Garvin, table 12x42".
No. 3H LeBlond univ., heavy duty.
No. 3 Cincinnati, table 12x46".

No. 3 Becker Brainard, table 12x40".
No. 2 Cincinnati univ., table 8x35".
Brown & Sharpe, 4"x28" universal table, (2).
No. 3 Garvin hand, horizontal.
Whitney hand.
And many others.

MISCELLANEOUS.

Boring mill, 38" Beaman & Smith.
Boring mill, 34" Bullard vertical.
Boring mill, 31" Newton car wheel.
Boring mill, 30" Bullard vertical.
Grinder, disc, No. 17 Besly.
Grinder, tool room, Heald univ.
Grinder, roll, 54"x10 1/2" Diamond.

Grinder, Bath univ. tool and cutter.
Keyseater, 18" Baker Brothers.
Keyseater, 16" stroke Morton.
Punch presses, all sizes.
Saw, 6" Espen Lucas.
Slotter, 10" Sellers.

BOILERMAKERS' AND SHIP MACHINERY.

Flanging press, 100-150 tons capacity.
Punch, 43" gap Perkins, 1 1/2" in 1 1/2".

Riveter, 8 1/2" Wood hydraulic.

Large assortment of General Machinery.
Send for complete list.

SECOND-HAND MACHINERY

FOR SALE BY

Niles-Bement-Pond Company,

111 Broadway, New York

Located at our various factories and stores.

LATHES.

14"x 6' Bradford, c. r.
14"x 6' Whitcomb, taper, pan.
15"x 7' P. & W. speed lathe.
16"x 6' Whitcomb, q. c.
16"x 6' Reed, r. & f. rest.
16"x 8' Bradford, c. r.
18"x 6' Prentice.
18"x 8' LeBlond, quick change.

21"x 8' LeBlond, geared head, heavy duty.
21"x 8' Bradford, c. r.
21"x 10' Bradford, c. r.
22"x 8' Niles, c. r.
24"x 10' Whitcomb, q. c.
30"x 14' Niles, c. r.
30"x 16' Pond, quick change.

TURRET LATHES.

No. 6A Potter & Johnston automatic, motor drive.
2"x 24" Jones & Lamson, cone head.
2"x 24" Warner & Swasey, hollow hexagon.
2"x 26" Pratt & Whitney turret lathe.
28" size J. Gisholt, 34" spindle.
24" size I Gisholt, 220 volt, motor drive, d. c.
28" Milwaukee rigid.
34" size K Gisholt.

SHAPERS AND PLANERS.

14"x 6' Niles sgl. trav. head shaper.
26"x 26"x 6' Pond, 2 heads.
30"x 30"x 6' Pond, 2 heads.
30"x 30"x 8' Pond, 2 heads.
30"x 30"x 10' Pond, 2 heads.

30"x 30"x 12' Pond, 2 heads, 220 v., d. c., reversing motor drive.
32"x 32"x 6' Gray, 2 heads.
72"x 60"x 10' Pond, 2 heads.
72"x 72"x 24' Pond, hvy. forge, 3 hds.

MILLERS AND GEAR CUTTERS.

No. 3 Brown & S. univ., old style.
No. 2 LeBlond plain, single pulley.
No. 5 Brown & S. vert., old style.
No. 3 36"x 8" B. & S. gear cutter.

No. 4 36"x 9" B. & S. gear cutter.
No. 6 60"x 12" B. & S. gear cutter.
15" Gleason bevel gear generator.
24" Gleason bevel gear planer.

DRILLING MACHINES.

No. 1 Putnam, gooseneck.
32" Aurora, sliding head.
60" Niles, heavy vertical.
3' Grant radial drill and boring mch.
4' Prentice speed box radial.
4' Niles semi-universal, old style.

5' Niles semi-universal, old style.
6' Niles semi-universal, old style.
6' Pond heavy plain radial, 220 v., motor drive, d. c.
2 spindle Allen 12" o. h.
3 spindle Allen 12" o. h.

GRINDERS.

No. 11 Brown & Sharpe internal.
No. 3 B. & S. cutter and reamer.
4"x 30" No. 11 Brown & Sharpe pl.
10"x 30" universal Landis.

8"x 48" No. 14 Landis plain.
12"x 66" No. 4 Landis universal.
30" grindstone frame, B. & S.

BORING MACHINES

No. 1 Bement horizontal, 23" spindle, 5' table.
No. 2 Bement horizontal, 31" spindle, 6' table.
No. 3 Bement horizontal, 48" spindle, 9' table.
30" Niles turret borer.
42" Niles boring and turning mill.
10" Niles mill, 220 v. motor, d. c.

MISCELLANEOUS.

Air compressor, type 10, Ingersoll-Rand, steam driven, capacity 535'.
Air compressor, Ingersoll-Rand duplex, motor driven, with 35 h. p., d. c. motor, capacity 215'.
Blower, No. 10 Sturtevant.
Blower, No. 70 Buffalo.
Blue print mch., Wagenhorst, 60", vertical cylinder.
Engine, 164 h. p. McEwen, direct connected to 100 k. w. generator, d. c. 220 v.
Engine, 200 h. p. Brown, belted to 200 k. w. Westinghouse generator, d. c. 220 v.
Profiler No. 3 automatic, Keller.
Saw, 8" rounds, Higley.
Slotter, 6" Bement.

SECOND-HAND MACHINERY

FOR SALE BY

Badger-Packard Mch. Co., 133-139 W. Water St., Milwaukee, Wis.

LATHES.

- 11"x4' Seneca Falls speed lathe t. & l. pulley, c. s.
 16"x 7' Loose change gear, 4-step cone, s. b. g. engine lathe, with c. s.
 20"x10' Putnam, loose change gear, 4-step cone, s. b. g. engine lathe, with c. s.

MISCELLANEOUS.

- Drills, No. 2 Detroit 5-sp. semi-auto. horiz., with c. s.; no chucks or fixtures, (2).
 Exhauster, planing mill, No. 40 Sturtevant, slow speed.
 Feed water heater, 22"x69" Allis-Chalmers, Reynolds closed pat.
 Gear cutter, Whiton.
 Glue heater, steam 100 gal. Advance, Wetmore.
 Grinder, No. 6 Bealy disc, double apdl., belt dr., with c. s.
 Grinder, 72" Holmes auto. knife.
 Grinder, 10"x20" Landis universal with equipment.
 Grinder, Sterling univ. tool and reamer, complete univ. equipment, 95% new.
 Grinder, Cleveland profile, with motor for a. c. or d. c.; used 30 days.
 Miller, No. 10 Kemp Smith, hand.
 Miller, No. 1 Fox, hand, power feed, 95% new.
 Oven furnace, No. 1 Stewart, with blower.
 Pipe machine, 4" Armstrong, hand and power.
 Planer, 24"x24"x16" Fitchburg.
 Planer, 30"x30"x 8" Steptoe-McFarlane, single head, with c. s.
 Purifier, 30"x6" Buffalo, closed pat'n.
 Rivet spinning machine, Grant, 110 v., d. c., motor driven, 3/16" cap.
 Screw mch., 1 1/4"x17" Hartford auto.
 Steam pump, 5"x2 1/2"x6" Bard duplex.

FOR SALE BY

The Strong, Carlisle & Hammond Co., Cleveland, O., Detroit, Mich.

ENGINE LATHES.

- 14"x 6' Flather, c. r., standard pat.
 16"x 6' Bradford, c. r., 5-step cone, standard pattern.
 17"x 7' Fulton, c. r., g. f. h. plain turning lathe.
 16"x 6' Reed, c. r., standard pattern.
 18"x10' LeBlond, c. r. & t. a., 5-step cone, (2).
 18"x10' Springfield, c. r., 5-step cone.

TURRET LATHES AND SCREW MACHINES.

- 14" Lodge & Davis, plain head.
 14" Lodge & Davis, b. g.
 24" Davis turret boring and chucking lathe, with forming rest.
 No. 4 Warner & Swasey screw mch., with auto. chuck and wire feed.
 18" Acme screw mch., p. f. to tur., (4).
 24" Lodge & Shipley g. f. h. turret lathe, 2-step cone, 6" belt, p. f. to turret, with air chuck.
 1 1/2" A Cleveland automatic.
 No. 00 Brown & Sharpe automatic.
 2" Hartford full automatic.

GRINDERS.

- No. 10 Cochrane-Bly auto. bench saw filing machine.
 Whitney wet tool.
 Greenfield univ. cutter and reamer.
 B Standard Diamond grinders, (2).
 No. 1 Warner & Swasey, cock.
 Type "DE" Hisey-Wolf internal.
 8" Blount emery stand.
 Rivett ball race grinder, with countershaft.

HAMMERS.

- Coffman, post, power dr., 25 lbs., c. s.
 100 lb. Cady, belt drop, c. s.
 100 lb. Bradley upright helve, (2).
 30 lb. Bradley upright helve.
 200 lb. Bradley upright helve, (2).

RIVETERS.

- 11 1/2" throat Giant rivet spinner.
 No. 203 Giant rivet spinner.

PUNCH PRESSES.

- No. 11 Badger, hand.

MISCELLANEOUS.

- Cold saws, 12" Burke, (2).
 Cold saw, Higley.
 Drill, 5 spindle Detroit semi-auto.
 Filing machine, Simplex.
 Gear cutter, No. 2 Whiton auto.
 Hack saw, Excelsior, power.
 Hack saws, Victor, power, (3).
 Polishing stands, heavy, (2).
 Polishing lathes, City Machine Co., double end, (8).
 Polishing head.
 Tapper, 1/2" Burke, bench.
 Tapper, 1/2" friction vertical bench.

SECOND-HAND MACHINERY

FOR SALE BY

H. D. Warner, - - - - - **57 May St., Hartford, Conn.**
AIR COMPRESSORS.
 2 Chicago Pneumatic air compressors, 750 cu. ft. capacity, nearly new.

FOR SALE BY

Peninsular Machinery Co., 281 E. Jefferson Ave., Detroit, Mich.
 Drill, 20" Rockford, back geared
 Drill, 22" Rockford, back geared.
 Drill, 24" Rockford, sliding head.
 Drill, 24" Fostick radial.
 Drill, Pierle high spd. ball bearing.
 Grinder, No. 1 LeBlond univ. cutter.
 Grinder, No. 6 Blount, d. e. emery.
 Lathe, 14"x 6' LeBlond engine.
 Lathe, 16"x 6' LeBlond engine.
 Lathe, 17"x 8' LeBlond rap. produc.
 Lathe, 17"x 10' LeBlond automobile.
 Lathe, 18"x 8' LeBlond engine.
 Lathe, 18"x 8' LeBlond engine, quick change gear, motor drive.
 Lathe, 20"x 10' LeBlond engine.
 Lathe, 25"x 12' LeBlond engine, h. d.
 Miller, No. 24 LeBlond universal.
 Miller, No. 3H LeBlond universal.
 Planer, 24x24"x6' Rockford, agl. hd.
 Planer, 30"x30"x18, Rockford, 2 hds.

FOR SALE BY

Chas. Molitor Machinery Co., 124 S. Clinton St., Chicago, Ill.
LATHES.

36"x14' Putnam.	20"x 8' Davis, dbl. back geared, (2).
26"x10' American, quick change.	16"x 6' Hendey, quick change, taper.
21"x 8' LeBlond.	14"x 6' Hendey, quick change, taper.
20"x 8' American, qu. change, taper, backing off attachment.	17"x 6' Cincinnati, q. c., d. b. g., (2).
22"x10' Hamilton, q. c., d. b. g., (2).	18"x 8' Milwaukee, dbl. bk. geared.
20"x 8' Lodge & Shipley, qu. change.	18"x 8' Chard, (2).
	Kivett and Van Norman, bench, (8).

SHAPERS.

20" Hollingworth back geared crank.	18" Gould & Eberhardt b. g. crank.
16" Barker back geared crank, new.	16" Barker back geared crank, new.
16" Ohio crank.	26" Walcott geared, belt shift.
18" Hendey geared, belt shift.	

PLANERS.

32"x32"x8' Betts.	24"x24"x6' Pond, 2 heads.
33"x33"x8' Gray.	20"x20"x8' Hendey.

MILLING MACHINES.

No. 3 Brown & Sharpe universal.	No. 2 Becker vertical.
No. 2 Brown & Sharpe universal.	No. 0 Brown & Sharpe plain, (2).
No. 1 Cincinnati universal.	No. 25 Becker back geared, (2).
No. 2 Cincinnati plain, (4).	No. 18 Cincinnati, back geared, (2).
No. 2 Hendy plain.	No. 2 Cincinnati Lincoln type, (4).

SCREW MACHINES AND TURRET LATHES.

14" Acme.	22" Greenlee, (4).
1" Acme, (3).	18" Libby.
1" Smurr & Kamen, (3).	20" Pratt & Whitney.
1" Milholland.	3" Jones & Lamson, (4).
16" Woods tilting turret.	

PUNCH PRESSES AND HAMMERS.

No. 51 Niagara.	Adrian & Crosby presses.
No. 3 Ferracute horning.	No. 68 Bliss double action.
Bradley helve hammer.	No. 3 Royersford dbl. p & shear.
24"-36" single double crank, (4)	50 lbs. drop hammer.

MISCELLANEOUS.

Broaching mchs., No. 2 Lapointe, (2).	Grinder, 4-sp. Foote-Bu. ert. cock.
Drills, Langelier and Avey single and double spindle, (25).	Grinder, 12"x32 Landis auto. plain.
Gear cutter, 48" Gould & Eberhardt.	Grinder, No. 2 Brown & Sharpe auto.
Grinder, 18"x 9' Landis auto. plain.	Grinder, No. 11 Brown & Sharpe automatic.
Grinder, rotary, N. Y. Safety Co.	Miller and grinder, Saxon vertical.
Grinder, 10x36 Thomson auto. univ.	Pipe threaders, 2"-4".

SECOND-HAND MACHINERY

FOR SALE BY

A. A. McLaughlin & Company,

44 Atlas Bank Building,

Cincinnati, Ohio

Lathe, 15"x 6' Pratt & Whitney, with hollow spindle.....	\$ 250.
Lathe, 17"x 8' Greaves & Klusman, with turret head and hollow spindle.....	400.
Lathe, 17"x 8' Steptoe McFarlan	250.
Lathe, 18"x 8' Lathe & Morse.....	250.
Lathe, 22"x11' Lodge & Davis, with hollow spindle.....	800.
Lathe, 24"x10' Schumacher & Boye, with hollow spindle.....	880.
Planer, metal cutting, 28"x28" Putnam, with 7' bed.....	600.
Planer, metal cutting, 30"x8' Gould Bros.....	350.
Punch and shear, double, No. 4 Long & Allstatter.....	450.
Tumbling barrel, 36"x50, with cast-iron frame and staves.....	165.
Turret lathe, Buckeye, 16" swing, 8' bed.....	95.

FOR SALE BY

Cleveland Belting & Mchy. Co., 1922 Scranton Rd., Cleveland, O.

MACHINE TOOLS AT TOLEDO, OHIO

Write J. J. Hartle, Care Spencer Engineering Co., Toledo, Ohio.

Air cylinders, 9" (3).	Lathe, turret, 18"x8", (12).
Air cylinders, 11" (29).	Oil pump.
Air hoists, 8x8, (2).	Press, foot power.
Air hoist, 14x8.	Pump and accumulator.
Annealing furnaces, Quigley, (2).	Roller marking machines, (2).
Drill presses, Baker Bros., (2).	Shaper.
Grinders, Townsend, (12).	Spraying machine.
Lathes, 16"x8', (14).	Tank, 3-barrel.
Lathe, 16"x6' Hendey.	Tanks, 10-barrel, (2).
Lathes, 18"x6', (10).	Thread millers, (5).
Lathes, 18"x8' geared head, (9).	Tool hardening furnace.
Lathe, turret, 16"x8'.	Vises, drill press, (2).

821 Files—600' Pipe—2500' Copper Wire.

FOR SALE BY

B. C. Allen Machinery Co.,

104 S. Clinton St., Chicago

No. 4 Blower.....	\$ 35.	Lathe, 2x24 J. & L. fric. hd.....	\$ 300.
Bolt cutter, 1" Acme double.....	450.	Miller, No. 1 P. & W., hand.....	125.
Drill press, 15" Barnes.....	75.	Miller, No. 5 Burke, hand.....	265.
Drill press, 14" sens., h.-spd.....	40.	Miller, Steptoe, hand.....	425.
Drill press, 14" Avey.....	90.	Miller, No. 4 Garvin.....	225.
Drill press, 20" w. l. & p. f. d.....	125.	Miller, No. 2 Hendey, q. c. g.....	850.
Drill press, 20" lever fd., new.....	110.	Planer, 22x22x5 Fitchburg.....	450.
Drill press, 20" wheel & lever.....	100.	Planer, 27x27x7 New Haven.....	350.
Drill press, 13" 3-spindle.....	100.	Planer, 48x48x14, 3 heads.....	4000.
Drill press, 14" 4-spindle.....	150.	Punch press, No. 2, not inc.....	135.
Drill press, 24" Barnes, b. g.....	150.	Punch press, No. 3, inc.....	360.
Drill press, 26" Sibley, pwr. fd.....	160.	Punch press, No. 4, inc.....	500.
Die grinder.....	80.	Punch press, No. 4, not inc.....	350.
Emery grinders, Nos. 1, 2, 3 & 4.....		Punch press, foot.....	35.
Hack saw, 4x4.....	15.	Punch press, foot, Bliss No. 85.....	75.
Hack saw, Racine high speed.....	65.	Rolls, tinners', 30".....	25.
Lathe, 11"x5' South Bend.....	175.	Rolls, tinners', 16".....	14.
Lathe, 16"x8' Walcott.....	450.	Screw machine, 1" W. & S.....	400.
Lathe, 18"x6' Lodge & Davis.....	375.	Screw mch. fric. hd., 1 1/2" B & O.....	550.
Lathe, 18"x6' American, q. c. g.....	750.	Shear, alligator No. 46.....	190.
Lathe, 26"x16' Wright.....	725.	Shaper, 14" Hendey geared.....	225.
Lathe, 36"x16' Putnam.....	975.	Shaper, 20" Kelly, pl. crank.....	525.
Lathe, 14" Fox.....	200.	Shaper, 24" Hamilton, b. g.....	725.

SECOND-HAND MACHINERY

FOR SALE BY

J. L. Osgood,

45 Pearl St., Buffalo, N. Y.

Chucking lathe, 21" Potter & Johnson, \$350.
Screw machine, No. 5 Warner & Swasey, \$375.
Shell cutting-off machine 14" Williams.
Turret lathe, 12" Brown & Sharpe, \$200.

FOR SALE BY

Reliance Machinery Sales Co., 114 West Park Way, Pittsburgh, Pa.

Boring mill, 80" Pond, 2 heads.
Drill, 24" Milwaukee, new.
Drills, 20" Silver, new, (6).
Drills, 16" Canedy-Otto, new, (3).
Drills, 14" U. S. sensitive, new, (5).
Grinder, No. 3 B. & S., univ. cutter & r.
Grinder, Brandes tool, with motor.
Grinders, Yankee drill, all sizes, new.
Lathe, 18"x8" Superior, d. b. g., q. c. g.
Lathe, 20"x8" Lodge & S., grd. hd.
Lathe, 22"x10" Davis, d. b. g., q. c. g.
Lathe, 24"x12" Lodge & Shipley, t. a.
Lathe, 26"x10" 6" Walcott, d. b. g.,
q. c. g., t. a.
Lathe, 28"x12" Pittsburgh, q. c. g., t. a.
Libby lathes, 18", 22" and 26".

Miller, No. 4 Garvin universal.
Miller, No. 1 1/2 American plain, new.
Miller, No. 1 U. S. hand, new.
Planer, Pond 72"x48"x16", 2 heads.
Planer, 42"x72"x18" Powell, 3 heads.
Planer, 38"x38"x18" Pease, 2 heads.
Planer, 27"x27"x8" Powell, 1 head.
Presses, Loshbough-J., No. 4, new.
Presses, Loshbough-J., No. 5, new.
Presses, Willard No. 2-A, new, (2).
Presses, Willard No. 3-A, new, (2).
Punch, No. 1 Hilles & J., s. e., 7/8x1.
Shaper, 20" Smith-Silk.
Shaper, 16" Gould & Eberhardt.
Shaper, 24" Gould & Eberhardt.
Turrets, 24" & 28" Steinle & Gisholt.

FOR SALE BY

Frank Toomey, Inc.,

127-131 N. Third St., Philadelphia, Pa.

LATHES.

11"x5" new Keystone, plain change.
13"x5" 6" new Carroll-Jamieson, plain change.
14"x6" new Carroll-Jamieson, quick change.
15"x6" new Sidney, quick change, swings 17".
16"x24" new Rahn-Larmon, double back geared, quick change.
17"x8" new Sidney, quick change, swings 19".
19"x8" new Sidney, quick change, swings 21".
23"x14" new Sidney, quick change, swings 27".
24"/48"x16" new Rahn-Larmon gap, series G.

TURRET LATHES.

No. 5 Bardons & Oliver.

No. 1 Bardons & Oliver, screw.

VERTICAL BORING MILLS.

60" Bullard, two heads.

64" Niles, two heads.

PLANERS.

48"x48"x12" Hamilton, four heads,
motor drive.
36"x36"x8" Gray, two heads.

31"x23"x68" Smith, one head.
18"x18"x3" Wheeler, one head.

SHAPERS.

16" new Steptoe, back geared.
20" new Steptoe, back geared.

24" new Steptoe, back geared.
24" used Stockbridge, back geared.

MILLING MACHINES.

No. 4 Brown & Sharpe, plain.
No. 1 1/2 new American, plain.

No. 1 1/2 used Valley City, plain.
No. 1 United States, new, hand.

GRINDERS.

No. 1 Landis, internal.
No. 1 Fraser universal, new.

No. 1 Grand Rapids new cutter and
reamer.

DRILLING MACHINES.

72" Western, full universal.
48" Fosdick radial.
36" new Superior, sliding head.

32" new Superior, sliding head.
28" new Superior, sliding head.
25" new Superior, sliding head.

SECOND-HAND MACHINERY

FOR SALE BY

The Burke Machine Tool Co., . . . **Conneaut, Ohio**

Gas engine, 40 h. p. tandem Elyria, in good condition, now running...	\$400.
Lathe, 12" taper turning.....	125.
Planer, 18x18x4' Whitcomb.....	200.
Saw grinder, 30" automatic.....	75.

FOR SALE BY

C. M. Thompson Co., . . . **35 S. Clinton St., Chicago**

Drill presses, floor, 14".	Lathe, 10"x8' Flather.
Drill, Leiman Bros. jewelers', motor driven.	Lathe, 26"x16' Wright, solid spdl.
Grinder, 220 v., d. c., tool post.	Milling machine, Cox.
Lathe, 14"x6' Champion Tool Wks.	Screw machine, hand. No. 2 P. & W.
Lathe, 14"x6' Flather, taper attach.	Turret lathe, 2' J. & L., cone head.
Emery Grinders, small	Turret lathes, 24"x24" J. & L., late type.
High Speed Motors, etc.	

FOR SALE BY

E. B. Stickley Machinery Co. **Goebel Bldg., Detroit, Mich.**

Broach, No. 2 LaPointe.	Milling mche., No. 8 Becker duplex.
Drill presses, 12" Leland & G., (4).	Milling machine, No. 0 Rockford pl.
Drill pr., No. 9 Garvin duplex horiz.	Milling machine, No. 4 B. & S. pl.
Drill press, No. 11 6-sp. Natco mult.	Milling mch., slab type, 42"x42"x12"
Drill press, No. 13D Moline, 4 hds.	Ingersoll.
Gear shapers, 36" Fellows, (4).	Shaper, 24" Kelley.
Gear shapers, single tooth round's, (2)	Turret lathes, 21" Gisholt, (2).
Grinders, cylinder, No. 60 Heald, (6).	Turret lathes, No. 24 New Britain
Grinder, cylinder, No. 23 Brown & S.	semi-automatic, (2).
Grinder, plain, 12x42 Landis.	Turret lathe, No. 54 New Britain
Grinder, plain, 16x66 Landis.	semi-automatic.

FOR SALE BY

The O'Brien Machinery Co., **119 N. Third St., Philadelphia, Pa.**

Boring and turning lathes, 26"x10' Walter Scott, 2-step cone, d. b.g., 8" belt; some fitted with turret on carriage, six 3" holes in turret; turning lathes swing 8' 4" between centers, 22" over carriage; price low for quick sale; photo and complete specifications on request, (12).

Drills, Allen 2-spdl. high speed, (5).	Planer, 36"x26"x10' Pond.
Lathe, 8"x108" Fitchburg Lo-Swing.	Press, No. 8 Stiles, heavy geared.
Lathes, 26"x12' Bridgeford, heavy duty, (4).	Press, Ferracute C-4.
Lathes 16"x6' Reed, (2).	Press, Henderson inclinable type,
Lathes 18"x7' Oliver, (2).	30"x4" and 32"x5" wheels.
Lathes, 21"x8' LeBlond, (2).	Press, solid back, Henderson, wheel
Lathe, 22"x10' Prentice, geared hd.	30"x4".
Lathe 24"x10' National.	Punch and shear, single end, capa-
Lathe, 35"x18' Bement.	city 1" in 8", new.
Millers, Kempsmith No. 32 Lincoln type, (3).	Punch and shear, double end, capa-
Millers, No. 7-H Becker, Lincoln type, (5).	city 8" in 8", new.
Millers, No. 6 Whitney, hand, (6).	Radial drill, 26" Mueller plain
Pipe machine, 6" Jarecki.	Shaper, 16" Hollingworth, back grd.
Planer, 24"x24"x6' American.	Shapers, 12", 20" and 24" Juengst.
Planers, 30"x30"x10' Sellers.	Turret lathe, 24" Gisholt horizontal.
	Turret lathes, No. 4 B. & O., (2).
	Turret lathes, No. 5 Bardons & Oliver, (2).

SECOND-HAND MACHINERY

FOR SALE BY

H. D. Warner,

57 May St., Hartford, Conn.

AUTOMATICS.

No. 4-A Potter & Johnston automatics, (30).

No. 5-A Potter & Johnston automatics, (6).

All with special head, though suitable for a large variety of chucking work.
Bargain prices.

FOR SALE BY

The Osborne & Sexton Machinery Co.,

Columbus, Ohio

LATHES.

9" to 13" Barnes, h. s., cp. r., new.

13-15-16 and 18 O. & S., h. s., c. r., new.

18"x 8" Fitchburg, hol. spdl., cp. r.

19"x12" Gray, compound rest.

TURRET LATHES AND

20"x10" Hamilton, double back gear.

21"x10" and 24"x12" South Bend.

25"x24" Fifeild.

30"x12" Star, hollow spdl., cp. rest.

SCREW MACHINES.

No. 52 to 56 National Acme.

No. 2 W. & S. hollow hexagon.

Wells hand screw machine.

1" Garvin hand screw machine.

14" S. & K. hand screw mches., (3).

15" Tilted turret hand screw mche.

2x24 & 3x36 J. & L., dbl. equipment.

1" Hartford single spindle auto.

SHAPERS AND PLANERS.

14" Niles, traveling head.

16, 18 & 24" Barker, back gear crank.

16" Kelly crank, back geared.

20" Walcott geared shaper.

22"x22"x 6" Gray, 1 head.

32"x32"x10" Niles, single head.

36"x36"x16" Niles, double head.

60"x60"x17" Betts, double head.

PRESSES.

No. 1 Consolidated and Toledo, (10)

No. 2 Sidney o. b. inclinable, 1600 lb.

No. 32-P Toledo, (2).

No. 194 Bliss, with feeding attach.

Perkins, dbl. crank, 16x24 bolster.

Covington, 10' 6" between housing.

DRILLS AND RADIALS.

Henry & Wright sgl. spdl., high spd.

34" Canedy-Otto plain, new.

4" Baush plain, heavy pattern.

44" Universal, cone drive.

Sensitive 1, 2 & 3 spindle.

High speed sgl. spdl. Cleveland.

20" Aurora, with tap attachment.

20", lever feed, (30).

24", 26" and 28" sliding head.

Quint 6-hole turret drill.

MILLING MACHINES.

No. 2 Kemp Smith plain, (2).

No. 25 Becker plain, (3).

Ames, Lincoln type, 10"x40" table.

No. 12 Brown & Sharpe, (2).

No. 14 Valley City universal.

No. 4 Cincinnati plain.

No. 14 Valley City plain, new.

No. 3 Brainard, 30x7 table.

GRINDERS

No. 3 W. & M. wet surface.

6x18 Landis, plain.

Capital, internal, practically new.

Landis 10x24 universal.

Litter 10x20 universal.

30x10 Webster & Perks, univ., new.

Cutter, reamer and tool, new.

Cincinnati cutter and tool.

MISCELLANEOUS.

Balancing machine for pulleys.

Band saws, metal, 30" Wright, (2).

Boring mill, 12", 2 swivel heads.

Compressor, 8"x8" H. & B. belt.

Cut-off machine, 3" Davis.

Dynamo, plating, 2500 amp., 8 volt.

Hammer, 40 lbs. Bradley helve.

Hammer, 55 Williams White Justice.

Motor, 75 h. p. 220 volt, 3 phase.

Pipe machines, 4, 6 and 12".

Second-Hand Wood-Working Machinery

For a large list of used wood-working machinery, consult the **Wood-Working Machinery List**, a publication similar to this but devoted to the advertising of saw-mill and wood-working machines. A copy may be had on application to the publisher, **A. H. Hitchcock, 1220-1235 Caxton Building, Chicago, Ill.**

Used Machine Tools

1—26"x14' Fifield Engine Lathe.

1—26"x16' Fifield Engine Lathe.

1—42" Cincinnati Upright Drill.

1—20" 4-Spindle Barnes Gang Drill.

1—20" 4-Spindle Hoefler Gang Drill.

1—26"x16' Flathead Lathe.

1—No. 1 Kempsmith Plain Milling
Machine.

1—Beaman & Smith 4-Spindle Vertical
Cylinder Boring Machine.

Vonnegut Machinery Co.
Indianapolis, Ind.

Re-MANUFACTURED - (ORIGINATED BY US) - MACHINE TOOLS

Real Bargains

Every Re-Manufactured machine is being offered at real bargain prices. In fact, we can sell our Re-Manufactured tools, which compare favorably with new, at prices lower than those of the ordinary used tools.

LATHES.

- 42-14"x 6' Reed. Ex. Hvy., Pl. Eng.
- 7-16"x 6' Reed Engine.
- 1-16"x 6' Reed Engine.
- 1-16"x 7' Reed Engine.
- 14-17"x 6' LeBlond Rapid Prod.
- 1-17"x 6' LeBlond Engine.
- 8-17"x 8' LeBlond Engine.
- 21-18"x 8' Boye & Emmes Eng.
- 8-18"x 8' Boye & Emmes.
- 20-18"x 8' LeBlond Engine.
- 1-18"x 8' Lodge & Shipley.
- 3-18"x 8' American Engine.
- 65-19"x 8' LeBlond Engine.
- 35-19"x 8' LeBlond Eng., P. F. T.
- 17-20"x 8' LeBlond Engine.
- 17-20"x 8' American Eng., P. F. T.
- 113-20"x 8' American Engine.
- 2-21"x 8' LeBlond Engine.
- 58-21"x 10' LeBlond Engine.
- 14-25"x 10' LeBlond Engine.
- 2-26"x 12' Wickes Engine.
- 33-26"x 10' Niles Engine.
- 3-26"x 12' Putnam Mtr. Driv. Eng.
- 75-26"x 10' Bridgeford Engine.
- 30-26"x 12' Bridgeford Engine.
- 16-26"x 14' Bridgeford Engine.
- 7-26"x 16' Bridgeford Engine.
- 10-26"x 18' Bridgeford Engine.
- 5-26"x 20' Bridgeford Engine.
- 9-30"x 11' American Gd. Hd. Eng.
- 3-30"x 15' American Gd. Hd. Eng.
- 3-30"x 20' American Gd. Hd. Eng.
- 23-32"x 12' Pittsburgh Engine.
- 6-40"x 12' Fifeild Engine.
- 4-40"x 18' Fifeild Engine.

GRINDERS.

- 1- 6"x 32" Norton Plain.
- 3-10"x 36" Norton Plain.

GRINDERS-CONTINUED.

- 1-10"x 50" Norton Plain.
 - 1-No. 1 1/2 Bath.
 - 1-No. 22 Brown & Sharpe Internal.
 - 1-36" Pratt & Whitney Vertical.
- ### UPRIGHT & RADIAL DRILLS.
- 1-1K Henry & Wright Sensitive.
 - 4-2K Henry & Wright Sensitive.
 - 3-3K Henry & Wright Sensitive.
 - 1-3 spindle Allen Sensitive.
 - 2-4 spindle Allen Sensitive.
 - 1-No. 25 Foote-Burt.
 - 3-3' American Sensitive.
 - 1-3' Fosdick Plain.
 - 1-5' Putnam.

MILLING MACHINES AND GEAR CUTTERS.

- 1-No. 20 Osterlein Universal.
- 3-No. 1A Brown & Sharpe Univ.
- 1-No. 1 1/2 Brown & Sharpe Plain.
- 1-No. 2A Brown & Sharpe Univ.
- 1-No. 2A Hendey Universal.
- 1-No. 3G Hendey Universal.
- 1-No. 9 Kempsmith Plain.
- 1-No. 5 Hecker-Brainard Plain.
- 1-No. 4 Becker-Brainard.
- 1-No. 3-26" B. & S. Gear Cutters.
- 3-No. 3-36" B. & S. Gear Cutters.

PLANERS.

- 1-24"x 24"x 6' Hamilton.
- 1-36"x 36"x 17' Powell, 2 heads.
- 1-48"x 48"x 18' Sellers Spiral, 1 hd.
- 1-76"x 48"x 18' Woodward & Powell, 2 heads.

BORING MILLS.

- 1-51" Bullard Vertical.
- 1-24" Cleveland Horizontal.
- 1-34" Binase Horizontal.
- 1-4" Niles Horizontal.

Write for our Green List describing these and many others

HILL, CLARKE & CO. OF CHICAGO

649 W. WASHINGTON BLVD., CHICAGO, ILL.

Good Used Tools

We offer the following used machine tools. Further particulars gladly given on receipt of request. We have facilities for overhauling used machinery and aim to offer only trustworthy machines.

BORING MACHINES.

- 60" Bullard vertical boring mill, 2 swivel heads, plain cone drive.
- 8' Betts vertical boring mill, 2 swivel heads, one friction head, motor drive.
- No. 2 Rochester, table type, belt driven.
- No. 2 Beaman & Smith, 4" dia. spindle, 6 $\frac{1}{2}$ h. p. Reliance motor, 2 h. p. head elevating motor.

DRILLING MACHINES.

- No. 1-1 spindle Avev, bench (24).
- No. 1-1 spindle Avev, column.
- 2-sp. Taylor & Fenn manufacturing.
- 3-sp. Taylor & Fenn manufacturing.
- 4-sp. Sigourney.
- 4-sp. Henry & Wright BB.
- 7-sp. Henry & Wright BB.
- No. D1 Colburn heavy duty reg. (6).
- 23" Mechanics stat. hd., w. & l., p. f.
- 24" Mechanics sliding hd., b. g., p. f.
- 28" Barnes sliding hd., b. g., p. f. (3).
- No. 13, 6-sp. P. & W., 21x9 head.
- No. 12, 12-sp. P. & W.
- 6-sp. Hendey, power fd. to each spdl.

GRINDERS.

- No. 4 12x60 Landis universal.
- 6x48 Pratt & Whitney plain.
- No. 2 B. & S. universal.
- No. 2 Oakley univ. cutter and tool.
- No. 11 Rivett, oscillating.
- No. 6 Bryant internal.
- No. 34 Van Norman internal with water att., (2).
- No. 70 Heald internal.
- No. 16 Blanchard vertical surface, direct motor drive.
- No. 3 Walker surface, magnetic ck.
- No. 5 Rivett hand feed oscillating.
- Garrigus rotary surface (14).
- 20" Diamond disc, right and left hand tables.
- Pratt & Whitney vertical surface, 36" mag. and new rotary chucks.
- No. 1 Hartford auto. surface.
- 20" Bealy disc, right and left hand tables.
- 20" Taylor & Fenn wet tool with new wheels, (10).

LATHES.

- 9x12 Porter Cable, with taper and facing attachment.
- 14"x6' Prentice Bros., with chuck.
- 14"x6' Lodge & Shipley, c. r., p. c. f. oil pan and pump, (6).
- 14"x6' Porter, c. r., p. c. f., hol. sp.
- 16"x6' Hendey, geared head, c. r., p. c. f., hollow spdl., agl. pulley.
- 18"x8' Prentice Bros., geared head, agl. pulley, q. c., chuck fitted.
- 20"x12' Lodge & Shipley, patent hd.
- 44"x16' Niles, single back geared, 4" raising blocks.
- 30"x10' Gleason, plain rest, p. c. f.
- 26"x12' Putnam, c. r., d. b. g.
- 56"x24' Wood & Light, b. g., c. r., p. c. f.

MILLING MACHINES.

- No. 3 Fox plain, p. f.
- No. 1 Dow plain, b. g.
- No. 23 $\frac{1}{2}$ Fox plain, p. f.
- 12" Cincinnati plain mfg., (11).
- No. 2 Owen plain, new 3C Cinn. vise.
- No. 2 Kempsmith univ., b. g.
- No. 3 Becker vert., belt drive.
- No. 2 Cinn. vert., cone drive.
- No. 7 HS Becker, Lincoln, (3).
- No. 1 $\frac{1}{2}$ Cinn. pl., new 2C vises, (2).

SCREW MACHINES.

- No. 0 Foster wire feed.
- No. 2 Foster wire feed, (3).
- No. 1 P. & W. wire feed.
- 20" J. & L. geared head monitor.
- 2x24 J. & L. flat turret.
- No. 3 Acme grd. hd. flat turret, bar and chucking equip., taper.
- 2" Cleveland automatics, (5).
- 4 $\frac{1}{2}$ " Cleveland automatics, (2).
- Fay auto. lathe.

MISCELLANEOUS.

- Broaching mach., No. 4 Lapointe.
- Die slotter, Garvin, with rotary table and micrometer.
- Planer, 24x24x6 Flather.
- Planer, 24x24x6 Putnam.
- Planer, 30x30x8 Woodward & P.
- Shaper, 20" Hendey.
- Shaper, 24" Juengst, crank.

Henry Prentiss & Company

Incorporated

149 Broadway

New York

We Have For Sale in Our Warehouse
40 Briggs High Duty Milling Machines

Type "A", Made by Gooley & Edlund

Used three to six months in the manufacture
of light gun parts

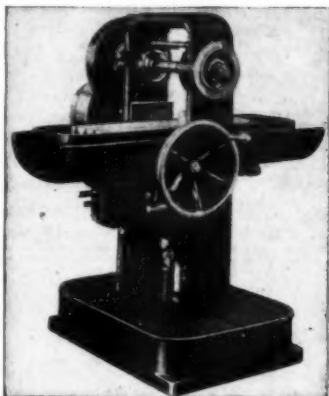


Table traverse.....	16".
Size of table.....	24x8.
Between housings.....	12 $\frac{1}{4}$ ".
Taper of arbor No. 11 Brown & Sharpe.	
Maximum distance, table to arbor...	12".
Feed changes	eight.
Floor space.....	42x52.
Weight.....	2300 lbs.

PRICE, each.....**\$400.**
less 10% in lots of six.

J. L. LUCAS & SON, Inc.
No. 3 Fox Street, BRIDGEPORT, CONN.

Pattern Shop Machinery

Special Prices if you refer to this ad.



Band Saws

Chicago No. 00 27 in. Wheels
 " No. 0 32 " "
 " No. 1 36 " "



Saw Tables

Chicago No. 5 Stationary Table
 " No. 9 Tilting Table
 " No. 10
 Boring attachment if wanted.



Jointers

8 in., 5 and 6 ft. tables and guard.
 12, 16, 20, 24 and 30 in., 7 ft. tables
 and guard.

Trimmers, Lathes, Core Box Tools, etc.

Ask for full descriptions

Chicago Machinery Exchange

1211-1227 Washington Boulevard, Chicago

50 Briggs Millers—Type A.

50 Whitney Hand Millers.

100 Spindles Ball Bearing Drills
 3¼" & 4¼" Gridley.

P. & W. Thread Miller.

27" Lathe 18' between centers.

Hand Screw Machines.

4 Precision Profilers—Bench.

10 Hydraulic Presses and Pumps.

Machinshop Equipment Corp'n

170 Oliver St., Boston, Mass.

PARTIAL LIST USED MACHINERY

In Cleveland Stock

BORING MILLS

- | | |
|-----------------------------------|----------------------------------|
| 1-36" Bullard V. T. L. | 1-72" Betts 2 heads. |
| 2-42" Bullard, 2 heads. | 1-100" Betts Tire Mill, 3 Heads. |
| 3-54" Bullard Maxi-Mills 2 heads. | 1-48" Bar Niles Horizontal. |
| 1-60" Niles. | |

BROACHING MACHINES

- 2-No. 0 J. N. Lapointe.

DRILLS

- 1-26" Aurora Sliding Head.
 1-24" Fosdick Radial with 3 H. P. Var. Speed D. C. Motor.
 1-3" Bickford Radial with 3 H. P. Var. Speed D. C. Motor.
 1-5" Fosdick Radial with 7½ H. P. Var. Speed D. C. Motor.
 3-5" Cincinnati Bickford Radials Cone Drive.
 1-6" Cincinnati Bickford Radial Gear Box Drive.
 1-6" Prentice Radial with 7½ H. P. D. C. Motor.

GEAR CUTTERS

- | | |
|------------------------------|---|
| 1-No. 3, 26" Brown & Sharpe. | 2-36"x9" Gould & Eberhardt Horizontal Type. |
| 1-No. 2 Whiton Automatic. | |

GRINDERS

- | | |
|------------------------------------|-----------------------------------|
| 10-No. 18 Bryant Internal. | 1-Garrigus Ring. |
| 6-No. 1½ Cincinnati Cutter & Tool. | 3-14x72 Norton Plain. |
| 6-4 spindle Foote-Burt Valve. | 2-16x72 Norton Double Head Pin. |
| 1-10x24 Norton Sgl. Purpose Mch. | 2-No. 1½ Landis Internal. |
| 1-10x50 Norton Plain C. S. Drive. | 1-No. 2 Brown & Sharpe Universal. |
| 2-10x36 Norton Plain C. S. Drive. | 1-12"x96" Landis Universal. |

LATHES

- | | |
|--|---|
| 4-9x12 Sundstrand. | 1-16x 8 Monarch 4-step Cone. |
| 1-14x 6 American 5-step Cone. | 2-16x10 Rahn Larmon (Stud). |
| 1-14x 6 Lodge & Shipley 5-step Cone, Taper Attachment. | 1-18x10 Shumaker D. B. G. Quick Change 3-step Cone. |
| 20-8x60 Fitchburg "Lo-Swing". | 1-21" South Bend Complete 4-step Cone (New). |
| 1-16x 8 Draper Quick Change D. B. G. 5-step Cone. | 1-22x14 Niles 4-step Cone. |
| 1-16x8 Bradford 5-step Cone D. B. G. | 1-24x10 Lodge & S. Selective Head. |
| 1-16x 8 Greaves-Klusman. | 1-30x14 Pond 5-step Cone. |

MILLING MACHINES

- | | |
|------------------------|------------------------------------|
| 5-Type "A" Briggs. | 2-10" Pratt & Whitney Automatics. |
| 3-No. 15 Garvin Plain. | 1-No. 1½ Brown & Sharpe Universal. |
| 6-No. 6 Whitney Hand. | |

PISTON RING MACHINES

- | | |
|-----------------------|---|
| 3-Plain Gridleys. | 2-No. 2-F Potter & Johnston, Eccentric. |
| 2-Eccentric Gridleys. | |

SHAPERS

- | | |
|--------------------|---------------------------------|
| 1-16" Ohio (Cone). | 1-20" Gould & Eberhardt (Cone). |
|--------------------|---------------------------------|

TURRET LATHES AND SCREW MACHINES

- | | |
|-----------------------------------|---------------------------|
| 10-24"x26" Cincinnati Acme Plain. | 1-No. 7 Bardons & Oliver. |
| 10-34"x36" Cincinnati Acme Plain. | 1-1"x7" Cincinnati Acme. |
| 2-1"x1" Cleveland Plain. | 6-24" Gisholts. |
| 1-2" Cleveland. | 5-21" Gisholts. |

We Re-Build the Machine. We Also Purchase Modern Tools.

THE NOTCH & MERRYWEATHER MACHINERY COMPANY

707-715 LAKESIDE AVE.,

CLEVELAND, OHIO

BRANCHES: CINCINNATI DETROIT PITTSBURGH

Second Hand Machinery

DRILLING MACHINES.

Demco bench drills, new, (5).

10" Baker, stationary head, hand lever and power feed.

GEAR CUTTERS.

46"x10" Gould & Eberhardt new type for spur gears only, (2).

ENGINE LATHES.

16" Reed stud lathe.

18"x 7' semi quick-change gear lathe.

18"x 6' Imperial chucking lathe, with turret.

21"x10' LeBlond crankshaft lathe.

30"x10' Fifeild, compound rest.

32"x16' Fay & Scott, compound rest, tur. on shears, turret tool post.

Bridgeport automatic threading lathe.

CUTTING-OFF MACHINES.

4' bed Hurlbut-Rogers cutting-off machines, (2).

PLANER.

36"x36"x12' Gray, two heads.

SHAPER.

28" Steptoe, shifting belt.

SCREW MACHINE.

1" Truman & Smith screw machine and countershaft.

Marshall & Huschart Machinery Co.

17 S. Jefferson St., Chicago, Ill.

Exceptional Value in Tools

New Or 98% New

2-16x52 Landis Plain Self-Contained Grinders.

1-No. 2 Wilmarth & Morman Surface Grinder.

2-16x10 Blount Speed Lathes.

2-13x 6 Blount Speed Lathes.

2-16x12 Lodge & Shipley Lathes, with pan and pump.

1-3" Jones & Lamson Lathe, with chucking equipment.

1-21" Gisholt Lathe, motor drive, 220 volt motor.

2-16" Acme Universal Turret Lathes with chasing bar.

1-14x6 Walcott Double Back Geared Lathe.

1-16x8 Walcott Double Back Geared Lathe.

1-18x8 Walcott Double Back Geared Lathe.

1-20x8 Walcott Double Back Geared Lathe.

1-No. 4 National Screw Machine, friction head.

1-Grant No. 81-A Riveting Machine.

2-16" Ohio Shapers, 1 Plain, 1 Heavy Duty.

2-20" Ohio Standard Duty Shapers.

1-24" Ohio Standard Duty Shape r

1-24x24x8' Ohio Planer.

The H. A. Smith Machinery Co., Inc.

501-505 East Water St.,

Syracuse, N. Y.

Reliabuilt Machine Tools

IMMEDIATE SHIPMENT

- 1 62" COLBURN Vertical Boring Mill, two swivel hds.
- 1 42" BEMENT Vertical Boring Mill, two swivel heads.
- 1 42" NILES Vert. Bor. Mill, one turret, one swivel hd.
- 2 No. 0 GIDDINGS & LEWIS Horizontal Boring Mills.
- 2 24" BULLARD Vert. Boring Mills, Production type.
- 2 36" BULLARD New Era Type Vertical Boring Mills.
- 1 52" BULLARD Boring Mill, two swivel hds., gr. feed.
- 1 96" POND Vertical Boring Mill, two swivel heads.
- 1 102" BETTS Vertical Boring Mill, two swivel heads.
- 2 15' HORIZONTAL Boring Mills, floor type, 10" bar.
- 1 No. 3 CINCINNATI Universal Miller, complete.
- 1 No. 3-B OWEN Plain Miller, vertical attachment.
- 10 No. 2 CINCINNATI Universal and Plain Millers.
- 1 No. 4 CINCINNATI Plain Miller, complete.
- 2 6' PRENTICE Radials, single pulley drive.
- 1 6' POND Radial, motor drive, complete.
- 1 5' BAUSH Radial Drill, cone drive, complete.
- 1 4' 6" BICKFORD Radial, complete.
- 1 48" x 48" x 12' HAMILTON Planer, 2 hds., arr. for four.
- 1 96" x 72" x 25' SELLERS Planer, four heads, complete.
- 1 36" x 36" x 10' CINCINNATI Planer, 2 hds., complete.
- 1 NEW 42" x 42" x 12' OPENSIDE Planer, two heads.
- 9 2 1/4" GRIDLEY Four Spindle Automatics, complete.
- 1 No. 5 BROWN & SHARPE Universal Grinder.
- 2 22"-46" x 8' PUTNAM Gap Lathes, complete.
- 1 55" x 22 1/4" POND Triple Geared Lathe.
- 1 26" x 10' LODGE & SHIPLEY Lathe, late type.
- 3 18" x 8' LODGE & SHIPLEY Lathes, late type.
- 20 20" x 8' AMERICAN High Duty Q. C. G. Lathes.
- 1 40" x 24" FIFIELD Lathe, triple geared.
- 1 No. 30, 12 Spindle BAUSH Drill, complete.
- 1 6" x 32" NORTON Grinder, complete.
- 1 18" DILL Slotter, complete.
- 2 BLANCHARD Grinders, complete.
- 2 No. 60 HEALD Grinders.
- 1 84" GOULD & EBERHARDT Gear Hobber.

Simmons Machine Co., Inc.
Albany, New York

1001 Singer Bldg., N. Y., 358 Ellicott Square, Buffalo

NEW MACHINES IN STOCK

No. 28 Ohio Plain Miller.
No. 29 Ohio Universal Miller.
No. 1 Kempsmith Universal Milling Machine.
No. 4 Kempsmith Plain Maximiller.
23" and 25" Snyder Drill Presses.
No. 1 Toledo Hand Milling Machines.
16" Ohio Shaper.
24" Ohio Shaper.
10x30 Webster & Perks Universal Grinder.
No. 1 Wilmarth & Morman Universal Grinder.
16" Bradford Lathe, 8' Bed.
16" Chard Lathe, 7' Bed.
Webster & Perks Nos. 1 and 2 Floor Type Grinders.
No. 0 Bickett Profiling Machine.
No. 32-B Demco Floor Type Drill Presses, two and three-spindle.
No. 2 Garvin Screw Slotting Machine.
No. 2 Grand Rapids Universal Grinder.

USED MACHINES IN STOCK

Bilton Plain Milling Machine.
12"x6" and 24"x12" Gould & Eberhardt Gear Hobbers.
No. 7 Foster Hand Screw Machines.
No. 3 Universal Tool & Cutter Grinder.
No. 2-26" and No. 2-36" Brown & Sharpe Gear Cutters.
2x24 Jones & Lamson Turret Lathes.
No. 1 Warner & Swasey Hol. Hex Turret Lathe.
6x6 Racine Hack Saw.

The Biggs-Watterson Co.

Cleveland, Ohio. Branches: Dayton, Ohio; Detroit, Mich.

New Boston Show Rooms

W. H. J. Fitzgerald & Co.

30 Oliver St., Boston

- 1 Foote-Burt Company No. 23 Heavy Duty Drill, 20" swing, single belt drive, capacity $\frac{5}{8}$ " to $1\frac{1}{4}$ ", guaranteed good as new.
- 2 No. 2 Warner & Swasey Turret Screw Machines, plain head, automatic chuck, bar feed, hand longitudinal feed to cut-off, with power feed to hexagon turret.
- 2 No. 1 Warner & Swasey Turret Screw Machines, plain head, automatic chuck, bar feed, lever feed to cut-off only, automatic chuck capacity $\frac{5}{8}$ ".

These machines are in A-1 condition.

Six $\frac{1}{4}$ Inch Automatic Screw Machines (Stehli Patent)

Each fitted with screw slotting attachment. Manufactured by Hartford Machine Screw Company. These machines adapted to the rapid production of all kinds of small screws, bushings, studs, etc. Condition, good as new.

Normal Times—Normal Prices

Hammers

250 Ton Mesta Steam Hydraulic Quick Acting Forging Press

- | | |
|--|----------------------------|
| 1500-lb. Bliss, board drop. | 300-lb. Bradley, helve. |
| 1500-lb. United Engineering Co., board drop. | 80-lb. Bradley, helve. |
| 800-lb. Merrill, board drop. | 80-lb. Yeakley, pneumatic. |

Punches and Shears

- Betts Punch, 20" gap, capacity 1" thru 1".
 Cleveland Punch, 19" gap, capacity 1" thru 1".
 Henry Pels Coping Machine, armor plate, capacity 10" beam.
 Bement Horizontal Punch, 60" gap, main gear 72"x7"; weight about 30,000 lbs.; capacity 1 1/2" thru 1 1/2".

Presses

- | | |
|--|--|
| No. 512 Bliss, 33 tons working pressure. | D4 Ferracute, roll f., wt. 6,000 lbs. |
| No. 540 Max Ams, geared, weight 6,000 lbs. | No. 1 Bliss, st. sided, geared, 14" str. |
| | No. 6 Farrel st. sided, geared, 5" str. |

Vertical Boring Mills

- | | |
|---------------------------------|--|
| 14' Standard, 2 swivel heads. | 60" Niles-Bement-Pond, 2 swivel heads—heavy, latest. |
| 10' Hilles & Jones single head. | 38" Baush, 2 swivel heads. |
| 90" Pond, 2 swivel heads. | 38" Bullard, 2 swivel heads. |
| 72" Bement, single head. | |

Milling Machines

- | | |
|-------------------------------------|---|
| No. 3 Hendey plain, geared feeds. | Newton vertical, heavy duty, 36" cutter head. |
| No. 2 Hendey plain. | Brainard slab miller, 76"x36"x12" housings adjustable to 54". |
| No. 2 1/2 Garvin universal. | |
| Hilles & J. vert. 24" rotary table. | |

Radial Drills

- | | |
|---|------------------------------|
| 6' Bickford semi-univ., sgl. pulley dr. | 5' Baush, motor driven. |
| 5 1/2' Niles, univ., box table, etc. | 3 1/2' Gang, box table, etc. |

Planers

- | | |
|-------------------------------|--|
| 60"x48"x20' Gleason, 3 heads. | 36"x36"x12' CINCINNATI, TWO HEADS, HEAVY TYPE. |
| 48"x36"x10' Ohio, 2 heads. | 30"x30"x14' Flather, 2 heads. |
| 42"x42"x12' Pond, 2 heads. | |

Lathes

- | | |
|---|--|
| 52"x22' Woodlute, triple geared, face plate drive, etc. | 28"x12' Fay & Scott. |
| 50"x16' Fifield. | Five(5) Fay Automatic Lathes, 22" swing, 6' bed. |
| 48"x20' Gleason. | 20"x 8' Lodge & Shipley, geared hd. |
| 42"x21' New Haven. | 16"x8' Reed Prentice, new, latest type |

Slotters

- 30" Bullard draw cut.
 Ames Combination Drill and Slotter, drills 54", slots 20".
 10" New Haven, circular table.
 Morton Portable, 6' stroke, 12' travel of head on base.

Grinders

- No. 5 Bath Duplex complete, good as new.
 No. 2 1/2 Bath Universal, complete.
 Hammett vertical, internal and external, complete.
 No. 3 Brown & Sharpe, surface table 14"x80".
 Two (2) No. 50 Gardner Disc Grinders, good as new.

NOTE—We have over 500 MACHINES to select from, all at our warehouse ready for immediate delivery, condition guaranteed.

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SCREW MACHIENS.

Foster No. 2 hand, 1" capacity, w. f., a. c., oil pump.
Costello hand, 1" capacity, with 16 collets, equip.
National Acme No. 55 automatics, extra equipment.
Bardons & Oliver No. 0 hand, 3/4" capacity, w. f., a. c.

LATHES.

Lodge & Shipley 14"x5', q. c. g., regular equipment.
Robbins 16"x6', c. r., 5 cone, 24" belt.
Flather 14"x5', elev. rest, 24" between centers.
Miami 13"x3 1/2', c. r., p. c. f., with 8" chuck.

MILLING MACHINES.

Becker No. 25 plain b. g., arbor, c. s., oil pot.
Becker No. 2 plain b. g., new model, wrk. sur. 37"x11".
Brown & Sharpe No. 7 plain, with 47" table, gilt edge cond.
Garvin No. 13 plain, cone drive, A-1 condition.

GRINDERS.

Bath No. 2 1/2 universal, 10"x36", with magnetic chuck.
Fraser No. 1, 8"x20" universal, A-1 condition.
Norton No. 1 Plain, t. d. and disc grind att.
Capital, internal.

MISCELLANEOUS.

Fairbanks Morse 10"x10" air compressor.
Gray planer 42"x36"x14", two heads.
J. & L. Flat Turret Lathe, bar equipment, late pattern.
Yankee twist drill grinder.

LYND-FARQUHAR CO., Dept. G Quality Machine Tools
BOSTON, MASS.

Grand Rapids Specials

Boring mill, horizontal No. 0.
Compressor, 4 1/2"x5 Imperial type
No. 2, (2).
Die filer, No. S-1 Oliver, 60 cyc.
Drill, No. 2 1/2 Avey h. s., 12"
overhang
Drill, 26" Sibley, sliding head.
Drill, 10-spindle Grand Rapids
multiple.
Electric furnace, Haskins type
FB-206.
Grinder, No. 1 Willey electric
tool post.
Grinder, No. 1 W. & M., surface.

Grinder, 8x30 Modern.
Grinder, No. 2 Bath universal.
Hammers, 100 lb. Little Giant, (2)
Hammers, 250 lb. Little Giant, (2)
Millers, No. 7 Becker Lincoln, (2).
Miller, No. 34 Ohio heavy plain.
Millers, No. 1-B Fox plain, (2).
Planer, 36"x36"x8' New Haven.
Punch & shear, No. 54 Beloit.
Press, No. P-3 Ferracute.
Radial, 3' Grand Rapids sens.
Radial, 3' Economic.
Sand blast, Pangborn type AC-6.
Shaper, 16" Barker.

Complete list on application

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"Everything in Shop Equipment" **Grand Rapids, Mich.**

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36"x12' Wickes, q. c. g., d. b. g.
24"x13' Chard, q. c. g., d. b. g.
24"x10' Advance, q. c. g., d. b. g.
20"x11' Chard, q. c. g., d. b. g., (2).
20"x9' Chard, q. c. g., d. b. g.
18"x9' Chard, q. c. g., d. b. g. (3).
18"x8' Advance, q. c. g., d. b. g.
16"x8' Cleveland, tool room.
16"x7' Chard, q. c. g.
16"x6' Cleveland tool room, (3).

14"x6' Amtew, d. b. g.
12"x4'6" Cleveland precision, (3).
12"x5'6" Davis tool room, (2).
12"x4'3" Shepard.
11"x4' No. 100 Wells, speed lathe.
6"x36" Dalton bench lathe.
4"x5' Elgin precision bench lathe.
No. 54 Sloan & Chase bench lathe.
Full line, Rivett precision bench lathes.

Drilling Machines

44' Morris plain radial.
4' Western heavy pattern plain.
3' Western manufacturing radial.
34' Canedy-Otto radial, (3).
36" Snyder traveling head.
32" Cleveland sliding head, (3).
28" Cleveland sliding head, (3).
25" Cleveland upright.
25" Silver sliding head.
22" Snyder upright (5).
224" Cleveland upright, (5).

21" Cleveland upright, (8).
20" Canedy-Otto, upright, (2).
20" Wisconsin, all-geared.
20" Milwaukee, lever feed, (3).
Nos. 1, 2 & 3 spdl. Demco, h. s., b. b.
2 spindle Cleveland, h. s., b. b.
14" U. S. sensitive.
Belt driven bench.
Motor driven bench.
Portable electric.

Milling Machines

No. 2 Cleveland universal, (6).
No. 2 Cleveland, plain.
No. 2-A Fox universal.
No. 2-B Fox plain, (3).

Nos. 1-A, 1-B and 0-B Fox plain.
No. 3 Becker standard vertical.
Nos. 2 and 3 Burke bench.

Grinders

No. 3 Modern universal, (2).
No. 2 Wilmarth & Morman surface.
No. 2 Reid surface.
24" Milwaukee wet tool.
Cleveland profile, (2).
No. 2 Norton cutter and tool.

Grand Rapids drill—various sizes.
Yankee drill—various sizes.
5x18 Ott plain.
Partridge floor stand—various sizes.
Portable electric.
Full line Rivett precision internal.

Miscellaneous

Arbor presses, Atlas, all sizes.
Filing machine, Nos. 2 & 3 Harry.
Gear hobbers, No. 3 Farwell, (2).
Hack saws, Peerless, 6x6, 9x9 & 13x16
Hack saw, No. 1 Racine.
Punch and shear, No. 12 Beloit.

Shaper, 16" Milwaukee.
Shaper, 18" Barker.
Shaper, 20" Milwaukee.
Shaper, 24" Milwaukee.
Shaper, 24" Barker.
Full line Pexto Tinnens' Tools.

USED MISCELLANEOUS

Drilling and tap'g mche., Murchey.
Grinder, tool post.
Lathe, 12"x5' Robbins.

Lathe, 16"x6' Morris.
Lathe, 16"x8' LeBlond.
Turret lathe, 24" Steidle.

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32" Milwaukee Chucking Lathe, heavily back geared...	\$1000.
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Two 24" Hoefler back geared Drills, each.....	275.
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26" Sibley b. g., s. h. Drill.....	350.
3½' Arm Canedy-Otto Mfg. Radial Drill.....	625.
No. 21 Landis Plain Cylindrical Grinder.....	500.
Two Diamond Roll Grinders, swing 6", take 35" between centers, table 66"x8", each.....	350.
Three Wilmarth & Morman Yankee Drill Grinders, ea.	125.
500 lb. Beaudry Upright Hammer.....	750.
600 lb. Bliss Board Drop Hammer.....	750.
Four 14"x6' Canedy-Otto b. g. Engine Lathes, each..	600.
One 16"x6' Canedy-Otto b. g. Engine Lathe.....	675.
One 24"x20' Niles b. g. Engine Lathe.....	1250.
One 20"x12' Schumacher & Boye Turning Lathe.....	375.
Three No. 0 Brown & S. Universal Milling Mchs., each	300.
One ¾" Grant Spinning Riveter.....	95.

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Guaranteed Rebuilt Machine Tools

24"x24"x6' G. A. Gray, 1 head.....	\$ 900.
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No. 1½ Valley City Universal Miller.....	1000.
6"x48" Pratt & Whitney Plain Grinder.....	850.
No. 1 Cinti Universal Cutter & Reamer Grinder...	325.
21"x10' LeBlond Lathe.....	1200.
24"x8' Lodge & Shipley Quick Change Lathe.....	850.
25"x10' LeBlond Hvy. Duty Quick Change Lathe	1500.
26"x10' Bridgeford Quick Change Lathe.....	1250.
18"x8' Milwaukee Semi Quick-Change Lathe.....	500.
16"x8' Flather Loose Change Lathe.....	390.
16"x6' Lodge & Shipley Quick Change Lathe.....	450.
38"x20' New Haven Loose Change Lathe.....	1750.

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- ✓ 1—3½' Prentice Radial, with gear box, single pulley drive.
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- ✓ 1—4' Universal Radial, arranged for motor drive.
- ✓ 1—No. 30 Natco 34-spindle Multiple, motor drive.
- ✓ 1—Baush 12-spindle Multiple, equipped for 34 spindles, capacity ½" to 1½".
- ✓ 4—Hoefer Drills, 21", 24", 26" and 28".

Bulldozers

- ✓ 1—No. 4 Rock River, arranged motor drive.
- ✓ 1—No. 2 Williams & White, belt drive.

Grinders

- ✓ 1—No. 2-A Landis 16x32 Universal Grinder.
- ✓ 1—No. 2 Manhattan Surface Grinder, (new).
- ✓ 2—Gardner No. 120 Double Disc Grinders.
- ✓ 1—Grand Rapids Drill Grinder, ½" to 2½".
- ✓ 1—Each Nos. 1, 2 and 3 Woods Univ. Tool & Cutter Grinders, complete, (new).

Shapers

- ✓ 1—16" Smith & Mills B. G. Crank Shaper.
- ✓ 1—16" Steptoe Single Geared Crank Shaper.
- ✓ 3—16" Whipp S. G. Crank Shapers, (new).
- ✓ 2—20" Ohio B. G. Crank Shapers, (new).
- ✓ 1—Each 16, 18, 21 and 24" Hollingsworth Bk. Geared Crank Shapers, (new).

Millers

- ✓ 2—No. 1½ American Plain Millers, (new).
- ✓ 1—No. 2 American Plain Miller, (used).
- ✓ 1—Lodge & Davis Plain Miller, with index centers, (used).
- ✓ 1—Each Nos. 2-B and 2 Rockford Univ. Millers, with index centers, (new).
- ✓ 1—No. 0 Bickett Vertical Miller and Profiler.
- ✓ 2—No. 1 U. S. Hand Millers.

Lathes

- ✓ 1—24" Gisholt Turret Lathe, chucking equipment, taper attachment traverse, (Modern).
- ✓ 1—Each Sidney Heavy Duty Lathes, 15, 17, 19, 25 and 27" Swing by 6, 8, 10, 12 and 14' beds, 3-step cone, D. B. G., Q. C.
- ✓ 1—Each Sidney Medium Pattern Lathes, 14, 16, 18 and 20" Swing by 6, 8 and 10' Beds, all 3-step cone, D. B. G., Q. C.
- ✓ 1—14"x 6" Flather Lathe, P. R., H. S.
- ✓ 1—20"x12" Porter Engine Lathe, compound rest, 1½" hollow spindle, complete 14" 4-jaw Ind. chuck fitted.

Miscellaneous

- ✓ 1—26"x24"x8' Pond Planer, 2 heads.
- ✓ 1—No. 2 Royersford Double End Punch and Shear, 7½" throat, cap. ½"x½".
- ✓ 2—No. 7 Long & Allstatter Punch and Shears, approx. 5" throat, cap. ½"x½".
- ✓ 1—No. 3 Long & Allstatter 3½" Tire Welder.
- ✓ 1—6-A Toledo Butt Welder, capacity 1½" rd.
- ✓ 1—Williams Pipe Machine, capacity ½" to 2".
- ✓ 1—Forbes Hand Pipe Machine, capacity ½" to 4".
- ✓ 1—Stockwell Griffith Bolt Cutter, with dies.
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10-ft. 2-in. between Housings.
Top Roll 9½-in. diam.
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Weight 17,000 lbs.
End Housing hinged so as to readily
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**Boring, Drilling and
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One—3-inch Bar, Single Pulley Drive,
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Both—A-1 Condition, little used.

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36"x18' 3-step cone, dbl. b. g., qk. change.
36"x16' 3-step cone, dbl. b. g., qk. change.
30"x20' 3-step cone, dbl. b. g., qk. change.
30"x18' 3-step cone, dbl. b. g., qk. change.
30"x16' 3-step cone, dbl. b. g., qk. change.
30"x14' 3-step cone, dbl. b. g., qk. change.
30"x14' triple geared, face plate drive.
30"x22' 3-step cone, dbl. b. g., qk. change.
30"x20' 3-step cone, dbl. b. g., qk. change.
30"x18' 3-step cone, dbl. b. g., qk. change.
28"x20' 3-step cone, dbl. b. g., q. c., taper.

**32 TURRET
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MACHINES**

32 "Warner & Swasey" type No. 4 Turret Screw Machines—
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Planer type Miller, 52"x48"x18", four heads.

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4-20" stroke, Back-gear Automatic vertical-feed to table-sup.

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30", 36", 40", 51" and 75".

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21", 3", 4"; also 5" Barrett type.

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2½' and 4'—Plain and Universal.

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Various sizes from 14" to 102" swing, 6' to 22' beds.

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Held Brothers, Co., Inc., Beverly, Mass.
Whiting & Comstock, Hartford, Conn.

Arbors, Roller Grip

Alert Tool Co., Philadelphia

Arbors, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.
E. O. Partridge 2047 W. Lake St., Chicago

Automatics

McDonough Mfg. Co., Eau Claire, Wis.
National Acme Co., Cleveland
New Britain Machine Co., New Britain, Conn.

Balancing Ways

Anderson Bros. Mfg. Co., Rockford, Ill.

Ball Bearings

Abbott Ball Co., Hartford, Conn.
Gwilliam Co., 253 W. 58th St., New York

Balls, Brass, Bronze and Steel

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Gwilliam Co., 253 W. 58th St., New York

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Armstrong-Blum Mfg. Co., 341 N. Francisco
Av., Chicago

Barrels, Tumbling

Abbott Ball Co., Hartford, Conn.
Buchanan Co., Thos., Cincinnati
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Benchs, For Toolmakers

Ritchie-Werts Co., Dayton, Ohio

Bench Legs, Steel

New Britain Mch. Co., New Britain, Conn.

Bending Machines, Hand and Power

Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Lourie Mfg. Co., Springfield, Ill.
Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Bending Rolls, Plate and Angle

Wickes Bros., Saginaw, Mich.

Blue Printing Machines

Wickes Brothers, Saginaw, Mich.

Bolt and Nut Machinery

Webster & Perks Tool Co., Springfield, Ohio

Boring Bars

Alert Tool Co., Philadelphia
Madison Mfg. Co., Muskegon, Mich.
Pedrick Tool & Machine Co., Philadelphia
Ready Tool Co., Bridgeport, Conn.
Rigid Tool Holder Co., Washington, D. C.
Underwood Corp., H. B., Philadelphia

Boring Bars, Cylinder

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Boring, Drilling and Milling Ma-

chines, Horizontal
Beaman & Smith Co., Providence, R. I.
Becker Milling Machine Co., Boston
Giddings & Lewis Mfg. Co., Fond du Lac, Wis.
Pawling & Harnischfeger Co., Milwaukee
Schipper Machine & Tool Co., Aurora, Ind.
Simmons Machine Co., Albany, N. Y.

Boring Heads

Waterson, J. M., Detroit, Mich.

Boring Machines, Cylinder

Burgett Mch. Tool Co., Meadville, Pa.

Boring Machines, Horizontal

Cincinnati Pulley Machinery Co., Cincinnati
Pedrick Tool & Machine Co., Philadelphia
Rockford Drilling Machine Co., Rockford, Ill.

Boring and Turning Machines, Vertical

Cincinnati Planer Co., Cincinnati
Simmons Machine Co., Albany, N. Y.
Turner Machine Co., Danbury, Conn.

Bowden Wire Mechanism

Gwilliam Co., 253 W. 58th St., New York

Brackets, Electric Light

Newman Mfg. Co., Cincinnati

Breaches

Lapointe Co., J. N., New London, Conn.

Breaching Machines

Lapointe Co., J. N., New London, Conn.
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Buchanan Chemical Co., C. G., Cincinnati
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Craftsman Tool Co., Connessat, Ohio

Casters for Trucks

Hamilton Caster & Mfg. Co., Hamilton, Ohio

Centers, Index

Abrasive Mch. Tool Co., E. Providence, R. I.
Brown & Sharpe Mfg. Co., Providence, R. I.
Carter & Hakes Mch. Co., W. Winsted, Conn.
Dickow, Fred C., 1856 W. Lake St., Chicago
Schipper Machine & Tool Co., Aurora, Ind.
Stephens Co., John, Cincinnati
Whiting & Comstock, Hartford, Conn.

Chains, Power Transmission

Culman Wheel Co., 1344 Altgeld St., Chicago
Morris Chain Co., Ithaca, N. Y.
Whitney Mfg. Co., Hartford, Conn.

Chasers

Modern Tool Co., Erie, Pa.
National Acme Co., Cleveland

Chucking Machines

New Britain Mch. Co., New Britain, Conn.
Wood Turret Machine Co., Brasil, Ind.

Chucks, Air

Frontier Chuck & Tool Co., Buffalo, N. Y.

Chucks, Centering

Cushman Chuck Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Thomas Elevator Co., 31 S. Hoyle Ave., Chicago

Chucks, Draw-in and Thrust

Hardinge Bros., 1770 Bertouau Av., Chicago

Chucks, Drill

Cushman Chuck Co., Hartford, Conn.
Dalton Mfg. Corp., 1911 Park Ave., N. Y.
Hartford Special Mch. Co., Hartford, Conn.
Jacobs Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Nielsen-Barton Chuck Co., 106 S. Jefferson
St., Chicago
Scully-Jones & Co., Ry. Exch. Bldg., Chicago
Thomas Elevator Co., 31 S. Hoyle Ave., Chicago
Weaver Mfg. Co., Springfield, Ill.

Chucks, Drill and Tap

Cushman Chuck Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Peter Bros. Mfg. Co., Algonquin, Ill.
Scully-Jones & Co., Ry. Exch. Bldg., Chicago

Chucks, Lathe

Cushman Chuck Co., Hartford, Conn.
Dalton Mfg. Corp., 1911 Park Ave., N. Y.
Hogson & Pettis Mfg. Co., New Haven, Conn.
Newman Mfg. Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.
Thomas Elevator Co., 31 S. Hoyle Ave., Chicago

Classified Finding Index

Chucks, Magnetic

Dalton Mfg. Corp., 1911 Park Ave., N. Y.
Herald Machine Co., Worcester, Mass.

Chucks, Wrenchless

Thomas Elevator Co., 31 S. Hoyne Ave.
Chicago

Clutches, Friction

Carroll Mfg. Co., L. W., Batavia, Ohio
Conway & Co., Cincinnati
Edgemont Machine Co., Dayton, Ohio
Milwaukee Shaper Co., Milwaukee, Wis.
National Clutch Co., 1859 Fulton St., Chicago

Cold Saws

Burke Machine Tool Co., Conneaut, Ohio
Cochrane-Hly Co., Rochester, N. Y.
Greenfield Tap & Die Corp., Greenfield, Mass.
Peter Bros. Mfg. Co., Algonquin, Ill.

Contract Work Wanted

Bonney Vise & Tool Works, Allentown, Pa.
Geuder, Paeschke & Frey Co., Milwaukee, Wis.
Mauch Chunk Iron Works, Mauch Chunk, Pa.
New Britain Machine Co., New Britain, Conn.
Robbins, Giamwell & Co., Pittsfield, Mass.
Seiber Machine Co., Utica, N. Y.

Couplings, Friction Clutch

Conway & Co., Cincinnati

Cranes, Hand Power

Euclid Crane & Hoist Co., Euclid, Ohio
Pawling & Harnischfeger Co., Milwaukee, Wis.
Weaver Mfg. Co., Springfield, Ill.

Cranes, Portable

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Canton Foundry & Mch. Co., Canton, Ohio
Weaver Mfg. Co., Springfield, Ill.

Cranes, Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Pawling & Harnischfeger Co., Milwaukee, Wis.

Crank Pin Turning Machine

Pedrick Tool & Machine Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cranks, Ball

Cincinnati Ball Crank Co., Cincinnati

Cutters, Adjustable

Recker Milling Machine Co., Boston, Mass.
McCroskey Tool Corporation, Mendville, Pa.
Madison Mfg. Co., Muskegon, Mich.

Cutters, Bolt

Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Cutters, Keyseating

Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Cutters, Milling

Recker Milling Machine Co., Boston, Mass.
Brown & Sharpe Mfg. Co., Providence, R. I.
Clough, R. M., Meriden, Conn.
Genesee Mfg. Co., Rochester, N. Y.
Michigan Tool Co., Detroit, Mich.
Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Cutting-Off Machines

Davis Machine Tool Co., Rochester, N. Y.
Etna Mfg. Co., Toledo, Ohio
Peter Bros. Mfg. Co., Algonquin, Ill.
Wood Turret Machine Co., Brasil, Ind.

Cylinder Boring Machines, Portable

Pedrick Tool & Machine Co., Philadelphia
Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Cylinder or Dome Facing Machines

Underwood Corp., H. B., Philadelphia

Die Heads, Self-Opening

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland

Dicing Machines

Henry & Wright Mfg. Co., Hartford, Conn.

Dies, Pipe Threading

Signal & Keeler Mch. Wks., Edwardsville, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.

Dies, Screw and Thread Cutting

Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berceau Av., Chicago
National Acme Co., Cleveland

Dies, Self-Opening Adjustable

Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Murchey Mch. & Tool Co., Detroit, Mich.
Rickert-Shafer Co., Erie, Pa.

Dogs, Machine

Ready Tool Co., Bridgeport, Conn.

Drilling Machine Heads

Harris Eng. Co., H. E., Bridgeport, Conn.
Nelson Blanch Mfg. Co., Detroit, Mich.
Newman Mfg. Co., Cincinnati
Rockford Drilling Machine Co., Rockford, Ill.
Sellew Machine Tool Co., Pawtucket, R. I.
Spafford Tool Works, Hartford, Conn.
United States Machine Tool Co., Cincinnati

Drilling Machines, Bench

Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
High Speed Hammer Co., Rochester, N. Y.
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mch. Co., Rockford, Ill.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Hand

United States Machine Tool Co., Cincinnati

Drilling Machines, Horizontal

Pawling & Harnischfeger Co., Milwaukee, Wis.
Rockford Drilling Mch. Co., Rockford, Ill.

Drilling Machines, Multiple Spindle

Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland, Ohio
Edlund Machinery Co., Inc., Cortland, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
National Acme Co., Cleveland
Reed Co., Francis, Worcester, Mass.
Rockford Drilling Mch. Co., Rockford, Ill.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling Machines, Portable Electric

Independent Pneumatic Tool Co., 600 W.
Jackson Blvd., Chicago
Stow Flexible Shaft Co., Philadelphia
Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Drilling Machines, Post

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland, Ohio
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Silver Mfg. Co., Salem, Ohio

Drilling Machines, Radial

Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Hammond Mfg. Co., Cleveland
Henry & Wright Mfg. Co., Hartford, Conn.
Mueller Machine Tool Co., Cincinnati
Pawling & Harnischfeger Co., Milwaukee, Wis.
Silver Mfg. Co., Salem, Ohio
Taylor & Fenn Co., Hartford, Conn.
Sipp Machine Co., Paterson, N. J.
Wickes Bros., Saginaw, Mich.

Drilling Machines, Sensitive

Burke Machine Tool Co., Conneaut, Ohio
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Demco Machine Tool Co., Cleveland
Edlund Machinery Co., Inc., Cortland, N. Y.
Fenn Mfg. Co., Hartford, Conn.
Hardinge Brothers, 1770 Berceau Av., Chicago
Henry & Wright Mfg. Co., Hartford, Conn.
Reed Co., Francis, Worcester, Mass.
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.
United States Machine Tool Co., Cincinnati
Wisconsin Electric Co., Racine, Wis.

Classified Finding Index

Drilling, Milling and Boring Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Knight Machinery Co., W. B., St. Louis, Mo.

Drilling Machines, Vertical
Aurora Tool Works, Aurora, Ind.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Cincinnati Pulley Machinery Co., Cincinnati
Davis Machine Tool Co., Rochester, N. Y.
Henry & Wright Mfg. Co., Hartford, Conn.
Hinckley Machine Works, Hinckley, Ill.
Minster Machine Co., Minster, Ohio
Rockford Drilling Machine Co., Rockford, Ill.
Silver Mfg. Co., Salem, Ohio
Sipp Machine Co., Paterson, N. J.
Taylor & Fenn Co., Hartford, Conn.

Drilling and Tapping Attachments
Aurora Tool Works, Aurora, Ind.
Demco Machine Tool Co., Cleveland
Harris Eng. Co., H. E., Bridgeport, Conn.
Henry & Wright Mfg. Co., Hartford, Conn.
McCroskey Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Newman Mfg. Co., Cincinnati
Reed Co., Francis, Worcester, Mass.
Schipper Machine & Tool Co., Aurora, Ind.
Sipp Machine Co., Paterson, N. J.
Turner Machine Co., Danbury, Conn.

Drills, Pneumatic
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago

Dust Handling Equipment
Knickerbocker Co., Jackson, Mich.

Emery Stands
Blount Co., J. G., Everett, Mass.
Buchanan Co., Thos., Cincinnati
Carroll Mfg. Co., L. W., Batavia, Ohio
Marchske Mfg. Co., Indianapolis, Ind.
Partridge, E. O., 2047 W. Lake St., Chicago

Emery Wheel Dressers and Cutters
Buchanan Co., Thos., Cincinnati
Cleveland Flus Cleaner Mfg. Co., Cleveland
Taylor & Fenn Co., Hartford, Conn.

Feeders, Oil and Soda Water
New Britain Machine Co., New Britain, Conn.

Filing Machines
Barry Mfg. Co., 615 W. Monroe St., Chicago
Cochrane-Bly Co., Rochester, N. Y.

Flexible Shafts
Stow Flexible Shaft Co., Philadelphia, Pa.

Forges
Canedy-Otto Mfg. Co., Chicago Heights, Ill.

Furnaces
Bennett Co., W. R., Elmwood, Conn.

Furniture, Machine Shop
New Britain Machine Co., New Britain, Conn.

Gauges, Amplifying, Snap and Plug
North Side Tool Co., Dayton, Ohio

Gauges, Taper
Hartford Special Mch. Co., Hartford, Conn.
Way Co., A. F., Hartford, Conn.

Gauging Machines
Davie Tool Co., Cleveland, Ohio
North Side Tool Co., Dayton, Ohio

Gear Cutting Machines
Brown & Sharpe Mfg. Co., Providence, R. I.

Grinding Machines, Bench
Blount Co., J. G., Everett, Mass.
Carroll Mfg. Co., L. W., Batavia, Ohio
Partridge, E. O., 2047 W. Lake St., Chicago
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Cutter, Reamer and Tool
Blount Co., J. G., Everett, Mass.
Clough, R. M., Meriden, Conn.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.

Harris Eng. Co., H. E., Bridgeport, Conn.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works., Grand Rapids, Mich.

Marchske Mfg. Co., Indianapolis, Ind.
Modern Tool Co., Erie, Pa.
National Acme Co., Cleveland
National Machine Tool Co., Racine, Wis.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Cylinder
Heald Machine Co., Worcester, Mass.
Whitney & Son, Baxter D., Winchendon, Mass.

Grinding Machines, Cylindrical
Brown & Sharpe Mfg. Co., Providence, R. I.
Greenfield Machine Co., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Manhattan Machine & Tool Works., Grand Rapids, Mich.

Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Schmidt Co., E. L., Davenport, Iowa
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio

Grinding Machines, Die
Abrasive Mche. Tool Co., E. Providence, R. I.
Manhattan Machine & Tool Works., Grand Rapids, Mich.

Modern Tool Co., Erie, Pa.
Reed Bros. Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Disc
Radger Tool Co., Beloit, Wis.
Sellew Machine Tool Co., Pawtucket, R. I.

Grinding Machines, Drill
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
La Salle Tool Co., La Salle, Ill.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Face
Marchske Mfg. Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio

Grinding Machines, Gage
Abrasive Mche. Tool Co., E. Providence, R. I.

Grinding Machines, Internal
Dalton Mfg. Corp., 1911 Park Av. New York
Heald Machine Co., Worcester, Mass.
Modern Tool Co., Erie, Pa.
National Machine Tool Co., Racine, Wis.
Ott Grinder Co., Indianapolis, Ind.
Taylor & Fenn Co., Hartford, Conn.
Thompson Grinder Co., Springfield, Ohio
Whitney & Son, Baxter D., Winchendon, Mass.
Wilmarth & Morman Co., Grand Rapids, Mich.

Grinding Machines, Portable
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago
Marchske Mfg. Co., Indianapolis, Ind.
National Machine Tool Co., Racine, Wis.
Stow Flexible Shaft Co., Philadelphia
Strand & Co., N. A., 625 W. Jackson Blvd., Chicago

Van Dorn Electric Tool Co., Cleveland
Wisconsin Electric Co., Racine, Wis.

Grinding Machines, Snagging
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Manhattan Machine & Tool Works., Grand Rapids, Mich.
Marchske Mfg. Co., Indianapolis, Ind.

Grinding Machines, Surface
Abrasive Mche. Tool Co., E. Providence, R. I.
Bristol Machine Tool Co., Bristol, Conn.
Heald Machine Co., Worcester, Mass.
La Salle Tool Co., La Salle, Ill.
Reid Brothers Co., Inc., Beverly, Mass.
Thompson Grinder Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Classified Finding Index

Grinding Machines, Universal

Brown & Sharpe Mfg. Co., Providence, R. I.
Grand Rapids Grinding Machine Co., Grand Rapids, Mich.
Greenfield Machine Co., Greenfield, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.
McDonough Mfg. Co., Eau Claire, Wis.
Modern Tool Co., Erie, Pa.
Ott Grinder Co., Indianapolis, Ind.
Simmons Machine Co., Albany, N. Y.
Thompson Grinder Co., Springfield, Ohio
Webster & Perks Tool Co., Springfield, Ohio
Wilmarth & Morman Co., Grand Rapids, Mich.

Hack Saw Blades

Racine Tool & Machine Co., Racine, Wis.

Hack Saw Machines

Armstrong-Blum Mfg. Co., 311 N. Francisco
Av., Chicago
Peerless Machine Co., Racine, Wis.
Racine Tool & Machine Co., Racine, Wis.

Hammers, Belt and Motor Driven

Barr H. Edall, Erie, Pa.
Beaudry & Co., Boston, Mass.
High Speed Hammer Co., Rochester, N. Y.
Quickwork Co., St. Marys, Ohio
United Hammer Co., Boston, Mass.

Hammers, Riveting

High Speed Hammer Co., Rochester, N. Y.

Handles, Machine

Cincinnati Ball Crane Co., Cincinnati

Heads, Dividing

Dickow, Fred C., 1858 W. Lake St., Chicago
Simmons Machine Co., Albany, N. Y.
Steppe Co., John, Cincinnati
Willard Press & Tool Co., Cincinnati

Hobbs

Michigan Tool Co., Detroit, Mich.

Hoists, Air

Independent Pneumatic Tool Co., 690 W.
Jackson Blvd., Chicago

Hoists, Electric

Euclid Crane & Hoist Co., Euclid, Ohio
Thomas Elevator Co., 31 S. Hoyne Ave.,
Chicago
Weaver Mfg. Co., Springfield, Ill.

Hoists, Electric Traveling

Euclid Crane & Hoist Co., Euclid, Ohio
Fawling & Harnischfeger Co., Milwaukee, Wis.

Hoists, Portable

Canton Foundry & Machine Co., Canton, Ohio

Jigs, Fixtures, Tools, Etc.

Craftsman Tool Co., Conneaut, Ohio
Hartford Special Mch. Co., Hartford, Conn.
Hincley Machine Works, Hincley, Ill.
Lee Co., Frank H., Danbury, Conn.
Nestor Mfg. Co., 40 W. 13th St., New York
North Side Tool Co., Dayton, Ohio
Spafford Tool Works, Hartford, Conn.
Way Co., A. F., Hartford, Conn.
Whiting & Comstock, Hartford, Conn.

Joints, Universal

Alnall Mch. & Tool Works, Hartford, Conn.

Keyseating Machines

Chattanooga Mch. Co., Chattanooga, Tenn.
Davis Machine Tool Co., Rochester, N. Y.
Lapointe Co., J. N., New London, Conn.
National Machine Tool Co., Cincinnati
Racine Tool & Machine Co., Racine, Wis.
Whitney Mfg. Co., Hartford, Conn.

Kaul Holder

Austin Tool & Machine Co., Inc., Pittsburgh

Lathe Accessories and Attachments

Dalton Mfg. Corp., 1911 Park Av., New York
Greaves-Klusman Tool Co., Cincinnati
McCrosky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Sidney Tool Co., Sidney, Ohio
Simmons Machine Co., Albany, N. Y.
South Bend Lathe Works, South Bend, Ind.

Lathes, Bench

Bount Co., J. G., Everett, Mass.
Dalton Mfg. Corp., 1911 Park Av., New York
Greenfield Tap & Die Corp., Greenfield, Mass.
Hardinge Brothers, 1770 Berneau Av., Chicago
South Bend Lathe Works, South Bend, Ind.

Lathes, Engine

Boye & Emmes Machine Tool Co., Cincinnati
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Chard Lathe Co., Newcastle, Ind.
Dalton Mfg. Corp., 1911 Park Av., New York
Davis Machine Tool Co., Rochester, N. Y.
Greaves-Klusman Tool Co., Cincinnati
Monarch Machine Tool Co., Sidney, Ohio
Mueller Machine Tool Co., Cincinnati
Sidney Tool Co., Sidney, Ohio
Smith Mfg. Co., Philip, Sidney, Ohio
South Bend Lathe Works, South Bend, Ind.
Willard Machine Tool Co., Cincinnati
Worcester Lathe Co., Worcester, Mass.
Wickes Bros., Saginaw, Mich.

Lathes, Flat Turret

Acme Machine Tool Co., Cincinnati

Lathes, Foot Power

Dalton Mfg. Corp., 1911 Park Av., New York

Lathes, Horizontal Turret

Acme Machine Tool Co., Cincinnati
Chard Lathe Co., Newcastle, Ind.
Davis Machine Tool Co., Rochester, N. Y.
Smarr & Kamen Co., 338 N. Albany Av.,
Chicago
Steinle Turret Machine Co., Madison, Wis.
Wood Turret Machine Co., Brazil, Ind.

Lathes, Short Cut

Adams Mfg. Co., O. R., Rochester, N. Y.
Sidney Tool Co., Sidney, Ohio

Lathes, Speed and Hand

Bount Co., J. G., Everett, Mass.
Greenfield Tap & Die Corp., Greenfield, Mass.

Lathes, Tilted Turret

Wood Turret Machine Co., Brazil, Ind.

Lockers, Shelving and Cupboards, Steel

Terrell's Equipment Co., Grand Rapids, Mich.

Mandrels, Expanding

Alert Tool Co., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.

Mandrels, Solid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Metal Cutting Machines, Sheet

Racine Tool & Machine Co., Racine, Wis.
Savage Co., W. J., Knoxville, Tenn.
Way Co., A. F., Hartford, Conn.

Milling Attachments

Brown & Sharpe Mfg. Co., Providence, R. I.
Burke Machine Tool Co., Conneaut, Ohio
Hincley Machine Works, Hincley, Ill.
Knight Machinery Co., V. H., St. Louis, Mo.
Steppe Co., John, Cincinnati
Whiting & Comstock, Hartford, Conn.
Willard Press & Tool Co., Cincinnati

Milling Machines, Automatic

Becker Milling Machine Co., Boston, Mass.

Milling Machines, Bench

Bicket Machine & Mfg. Co., Cincinnati
Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Hardinge Brothers, 1770 Berneau Av., Chicago
Simmons Machine Co., Albany, N. Y.

Milling Machines, Hand

Bristol Machine Tool Co., Bristol, Conn.
Burke Machine Tool Co., Conneaut, Ohio
Carter & Hakes Mch. Co., W. Winsted, Conn.
Davenport Mfg. Co., Meadville, Pa.
Steppe Co., John, Cincinnati
Whitney Mfg. Co., Hartford, Conn.

Milling Machines, Horizontal

Boorman & Smith Co., Providence, R. I.
Recker Milling Machine Co., Boston, Mass.
Gooley & Edlund, Cortland, N. Y.
Steppe Co., John, Cincinnati

Classified Finding Index

Milling Machines, Plain

American Milling Machine Co., Cincinnati
 Beaman & Smith Co., Providence, R. I.
 Becker Milling Machine Co., Boston, Mass.
 Bickett Machine & Mfg. Co., Cincinnati
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Burke Machine Tool Co., Conneaut, Ohio
 Cochrane-Bly Co., Rochester, N. Y.
 Davenport Mfg. Co., Meadville, Pa.
 Gooley & Edmond, Cortland, N. Y.
 Steptoe Co., John, Cincinnati

Milling Machines, Portable

Fairbank Tool & Machine Co., Philadelphia
 Underwood Corp., H. B., Philadelphia

Milling Machines, Universal

American Milling Machine Co., Cincinnati
 Becker Milling Machine Co., Boston, Mass.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Cochrane-Bly Co., Rochester, N. Y.
 Steptoe Co., John, Cincinnati

Milling Machines, Vertical

Beaman & Smith Co., Providence, R. I.
 Becker Milling Machine Co., Boston, Mass.
 Bickett Machine & Mfg. Co., Cincinnati
 Bristol Machine Tool Co., Bristol, Conn.
 Brown & Sharpe Mfg. Co., Providence, R. I.
 Burke Machine Tool Co., Conneaut, Ohio
 Clough, R. M., Meriden, Conn.
 Cochrane-Bly Co., Rochester, N. Y.
 Knight Machinery Co., W. B., St. Louis, Mo.
 Taylor & Fenn Co., Hartford, Conn.

Mills, Adjustable Hollow

Genesee Mfg. Co., Rochester, N. Y.

Motors, Electric

Reliance Electric & Eng. Co., Cleveland
 Wisconsin Electric Co., Racine, Wis.

Oil Cops

Gits Bros. Mfg. Co., 1940 S. Kilbourne Av.,
 Chicago

Oil Hole Covers

Tucker, W. C. & F. C., Hartford, Conn.

Oils, Quenching

Bell & Gossett Co., 613 W. 30th St., Chicago

Parallels, Adjustable

Herth Mfg. Co., O. B., Hartford, Conn.

Pattern Shop Machinery

Chicago Mch. Exchange, 1219 Washington
 Blvd., Chicago

Cochrane-Bly Co., Rochester, N. Y.
 Silver Mfg. Co., Salem, Ohio
 Towsley Mfg. Co., John T., Cincinnati

Pipe Bending Machines

Pedrick Tool & Machine Co., Philadelphia
 Underwood Corp., H. B., Philadelphia

Pipe Cutting and Threading Machines

Signall & Keeler Mch. Wks., Edwardsville, Ill.
 Simmons Machine Co., Albany, N. Y.

Planer Attachment, Radius

Underwood Corp., H. B., Philadelphia

Planer Tools, Circular

Underwood Corp., H. B., Philadelphia

Planers, Valve Seat, Portable

Pedrick Tool & Machine Co., Philadelphia
 Underwood Corp., H. B., Philadelphia

Planing Machines, Metal

Bickett Machine & Mfg. Co., Cincinnati
 Cincinnati Planer Co., Cincinnati
 Lee Co., Frank H., Danbury, Conn.

Pneumatic Tools

Independent Pneumatic Tool Co., 600 W.
 Jackson Blvd., Chicago

Polishing and Buffing Machines

Bloom Co., J. G., Everett, Mass.
 Canedy-Otto Mfg. Co., Chicago Heights, Ill.
 New Britain Machine Co., New Britain, Conn.
 Partridge, E. O., 2047 W. Lake St.,
 Stow Flexible Shaft Co., Philadelphia

Webster & Perks Tool Co., Springfield, Ohio
 Wilmarth & Morman Co., Grand Rapids,
 Wisconsin Electric Co., Racine, Wis. (Mich.)

Presses, Arbor

Atlas Press Co., Kalamazoo, Mich.
 Bartlett, Edwin E., Nashua, N. H.
 Canedy-Otto Mfg. Co., Chicago Heights, Ill.
 Lourie Mfg. Co., Springfield, Ill.
 Nicholson & Co., W. H., Wilkes-Barre, Pa.
 Weaver Mfg. Co., Springfield, Ill.

Presses, Broaching

Atlas Press Co., Kalamazoo, Mich.
 Bartlett, Edwin E., Nashua, N. H.
 Lourie Mfg. Co., Springfield, Ill.

Presses, Foot

Atlas Press Co., Kalamazoo, Mich.
 Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
 Lourie Mfg. Co., Springfield, Ill.
 Rockford Iron Works, Rockford, Ill.
 Taylor & Fenn Co., Hartford, Conn.
 Partridge, E. O., 2047 W. Lake St., Chicago

Presses, Power

Loshbough-Jordan T. & M. Co., Elkhart, Ind.
 Rockford Iron Works, Rockford, Ill.
 Willard Press & Tool Co., Cincinnati

Presses, Punch

Enterprise Machinery Co., 22 B. Clinton St.,
 Chicago
 Henry & Wright Mfg. Co., Hartford, Conn.
 Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
 Loshbough-Jordan T. & M. Co., Elkhart, Ind.
 Lourie Mfg. Co., Springfield, Ill.
 Partridge, E. O., 2047 W. Lake St., Chicago
 Rockford Iron Works, Rockford, Ill.

Presses, Screw

Atlas Press Co., Kalamazoo, Mich.
 Lourie Mfg. Co., Springfield, Ill.
 Manhattan Machine & Tool Works, Grand
 Rapids, Mich.
 Towsley Mfg. Co., John T., Cincinnati
 Weaver Mfg. Co., Springfield, Ill.

Pulley Machinery

Cincinnati Pulley Mch. Co., Cincinnati

Pulleys, Iron, Solid and Split

Conway & Co., Cincinnati
 National Clutch Co., 1859 Fulton St., Chicago
 Prott Fdry. Co., 328 N. Sangamon St. Chicago

Punch Press Feeds

Rockford Iron Works, Rockford, Ill.

Punches, Hand

Armstrong-Blum Mfg. Co., 341 N. Francisco
 Av., Chicago
 Hendley & Whittemore Co., Beloit, Wis.

Punches, Power

Clough, R. M., Meriden, Conn.
 Hendley & Whittemore Co., Beloit, Wis.
 Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
 Long & Allatattier Co., Hamilton, Ohio
 Wickes Bros., Saginaw, Mich.

Punches and Dies

Hendley & Whittemore Co., Beloit, Wis.
 Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
 Lewthwaite Mch. Co., T. H., 415 E. 31st St.
 North Side Tool Co., Dayton, Ohio (New York
 Rockford Iron Works, Rockford, Ill.)

Racks, Bar Stock

Yoke Supply Co., Wm. S., Canton, Ohio

Reamers, Solid

Clough, R. M., Meriden, Conn.
 McCroskey Tool Corporation, Meadville, Pa.
 Ready Tool Co., Bridgeport, Conn.

Reamers, Adjustable

Clough, R. M., Meriden, Conn.
 Greenfield Tap & Die Corp., Greenfield, Mass.
 McCroskey Tool Corporation, Meadville, Pa.

Reamers, Cylinder

Hinckley Machine Works, Hinckley, Ill.
 McCroskey Tool Corporation, Meadville, Pa.

Reels, Extension

Cincinnati Specialty Mfg. Co., Cincinnati

Classified Finding Index

Riveting Machines

Grant Mfg. & Mche. Co., Bridgeport, Conn.
High Speed Hammer Co., Rochester, N. Y.
Independent Pneumatic Tool Co., 890 W.
Jackson Blvd., Chicago

Red Cutters

Armstrong-Hilum Mfg. Co., 341 N. Francisco
Av., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Roller Bearings

Gwilliam Co., 253 W. 58th St., New York

Scraping Machines, Pneumatic

Anderson Brothers Mfg. Co., Rockford, Ill.

Screw Machines, Automatic

Brown & Sharpe Mfg. Co., Providence, R. I.
Cincinnati Automatic Mch. Co., Cincinnati
National Acme Company, Cleveland
New Britain Mche. Co., New Britain, Conn.

Screw Machines, Plain or Hand

Acme Machine Tool Co., Cincinnati
Smurr & Kaumen Co., 328 N. Albany Av.,
Chicago
Wood Turret Machine Co., Brazil, Ind.

Screws, Cap and Set

National Acme Company, Cleveland

Second-Hand Machinery Dealers

Allen Mch. Co., B. C., 104 S. Clinton St.,
Chicago
Badger-Packard Mch. Co., Milwaukee, Wis.
Bath & Co., Cyril J., Cleveland, Ohio
Bennett Machinery Co., G. L., 30 Church
St., New York
Biggs-Watterson Co., Cleveland
Broadway Machinery Co., Cincinnati
Brown-McDonald Mch. Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Cleveland Belting & Mch. Co., Cleveland
Dale-Brewster Machy. Co., 541 Washington
Blvd., Chicago
Easley Machinery Co., E. L., 655 Washington
Blvd., Chicago
Federal Mch. Sales Co., 12 N. Jefferson St.,
Chicago

Fitzgerald & Co., W. H. J., Boston, Mass.
Girard Machine & Tool Co., Philadelphia
Graves Mch. Exe. 50 Church St., New York
Harris Bros. Co., W. 35th & Iron, Chicago
Hill, Clarke & Co., 625 Wash't'n Bl., Chicago
Johnston Co., Wm. T., Cincinnati
Johnson & Sons Machinery Co., Wm. C.,
Kinsey Co., E. A., Cincinnati (St. Louis, Mo.)
Lucas & Son, J. L., Bridgeport, Conn.
Lynd-Farguhar Co., Boston, Mass.
McCabe Lathes & Machinery Corp., J. J.,
143 Broadway, New York
McCoy-Brandt Mch. Co., Pittsburgh, Pa.
McMullen Mch. Co., Grand Rapids, Mich.
Machineshop Equipment Corp'n., Boston
Marshall & Huchart Machinery Co., 17 S.
Jefferson St., Chicago
Molitor Machy. Co., Chas., 216 S. Clinton St.,
Chicago

Match & Mottweather Mch. Co., Cleveland
Niles-Bement-Fond Co., 111 Broadway, N. Y.
O'Brien Machinery Co., Philadelphia
Osborne & Sexton Machy. Co., Columbus, O.
Osgood, J. L., Buffalo, N. Y.
Pattison Supply Co., W. M., Cleveland
Pensular Machinery Co., Detroit, Mich.
Prentiss & Co., Henry, Singer Bldg., N. Y.
Russell Machines Co., Pittsburgh, Pa.
Simmons Machine Co., Albany, N. Y.
Smith Machinery Co., H. A., Syracuse, N. Y.
Stocker-Rumely-Wachs Co., 117 N. Jefferson
St., Chicago

Strong, Carlisle & Hammond Co., Cleveland
Thompson Co., C. M., 36 S. Clinton St. Chicago
Toomey, Inc., Frank, 127 N. 3rd St. Phila.
Vonnegut Machinery Co., Indianapolis, Ind.
Walsh Machinery Co., M. J., Milwaukee, Wis.
Warner, N. D., Hartford, Conn.
Wayne Machy. Co., Fort Wayne, Ind.
Winterer, Herman L., Philadelphia
White Machy. Co., A. D., 108 N. Jefferson
St., Chicago

Wright, David A., 568 Washington Blvd.,
Chicago

Shafts, Flexible

Stow Flexible Shaft Co., Philadelphia

Shaping Machines

Cochrane-Bly Co., Rochester, N. Y.
Columbia Machine Tool Co., Hamilton, Ohio
Davis Machine Tool Co., Rochester, N. Y.
Milwaukee Shaper Co., Milwaukee, Wis.
Osborne & Sexton Machy. Co., Columbus, O.
Rhodes Mfg. Co., Hartford, Conn.
Seliw Machine Tool Co., Pawtucket, R. I.
Simmons Machine Co., Albany, N. Y.
Smith & Mills Co., Cincinnati
Steptoe Co., John, Cincinnati

Shears, Hand

Armstrong-Blum Mfg. Co. 341 N. Francisco
Av., Chicago
Hendley & Whittemore Co., Beloit, Wis.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.
Tucker, W. C. & F. C., Hartford, Conn.

Shears, Power

Hendley & Whittemore Co., Beloit, Wis.
Long & Allstatter Co., Hamilton, Ohio

Sine Bars

Way Co., A. F., Hartford, Conn.

Slotting Machines

Clough, R. M., Meriden, Conn.
Rhodes Mfg. Co., Hartford, Conn.

Sprockets

Cullman Wheel Co., 1344 Altgeld St., Chicago

Stock Supports

Racine Tool & Machine Co., Racine, Wis.
Way Co., A. F., Hartford, Conn.

Swaging Machines

Etna Mfg. Co., Toledo, Ohio

Tables, Circular

Cochrane-Bly Co., Rochester, N. Y.
Hincley Machine Works, Hincley, Ill.
Lewthwaite Co., Geo. A., 116 Walker St., N. Y.

Tap Extractors

Walton Co., Hartford, Conn.

Tap Wrenches

Alert Tool Co., Philadelphia

Tapping Machines and Attachments

Beaman & Smith Co., Providence, R. I.
Burke Machine Tool Co., Connecticut, Ohio
Cincinnati Pulley Machinery Co., Cincinnati
Penn Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hammond Mfg. Co., Cleveland
McCrosky Tool Corporation, Meadville, Pa.
Modern Tool Co., Erie, Pa.
Rickett-Shafer Co., Erie, Pa.
Turner Machine Co., Danbury, Conn.
Webster & Perks Tool Co., Springfield, Ohio
Whitney Mfg. Co., Hartford, Conn.
Workwell Eng. & Mfg. Co., 616 W. Monroe
St., Chicago

Taps, Collapsing

Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.

Taps and Dies

Greenfield Tap & Die Corp., Greenfield, Mass.
National Acme Company, Cleveland

Thread Cutting Tool Jigs

G-L Sales Co., 521 W. 26th St., New York

Thread Milling Machines

Waltham Machine Works, Waltham, Mass.

Threading Tools

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Greenfield Tap & Die Corp., Greenfield, Mass.
Modern Tool Co., Erie, Pa.
Murchey Machine & Tool Co., Detroit, Mich.
National Acme Company, Cleveland
Ready Tool Co., Bridgeport, Conn.

Classified Finding Index

Tool Holders

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.
Rigid Tool Holder Co., Washington, D. C.
Wood Turret Machine Co., Brazil, Ind.

Tools, Boring

Alert Tool Co., Philadelphia
Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Rigid Tool Holder Co., Washington, D. C.

Tools, Lathe and Planer

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Ready Tool Co., Bridgeport, Conn.

Tools, Machinists'

Armstrong Bros. Tool Co., 308 N. Francisco
Av., Chicago
Brown & Sharpe Mfg. Co., Providence, R. I.

Tools, Spot Facing

Genesee Mfg. Co., Rochester, N. Y.

Tooth Rounding Machines

Cross Gear & Engine Co., Detroit, Mich.

Trucks, Elevating

Lewis-Shepard Co., Boston

Trucks, Machine Shop

New Britain Machine Co., New Britain, Conn.
Towsley Mfg. Co., John T., Cincinnati

Turntables

Canton Foundry & Machine Co., Canton, O.

Turret Heads, for Lathes

Newman Mfg. Co., Cincinnati

Valve Seat Planing Machines, Portable

Stow Flexible Shaft Co., Philadelphia
Underwood Corp., H. B., Philadelphia

Vises, Drilling Machine

Ainslie Mcbe. & Tool Works, Hartford, Conn.

Armstrong-Bloom Mfg. Co., 341 N. Francisco

Av., Chicago

Armstrong Bros. Tool Co., 308 N. Francisco

Av., Chicago

Carter & Hakes Mcbe. Co., W. Winsted, Conn.

Cincinnati Vise Co., Cincinnati

Hopson & Pettis Mfg. Co., New Haven, Conn.

Hollands Mfg. Co., Erie, Pa.

Martin Tool & Die Co., Springfield, Ohio

Nestor Mfg. Co., 40 W. 13th St., New York

Thomas Elevator Co., 31 So. Hoyne Ave.,

Yost Mfg. Co., Meadville, Pa. (Chicago)

Vises, Machinists'

Baker Cutlery & Hardware Co., 101 Duane

St., New York

Hollands Mfg. Co., Erie, Pa.

New Britain Machine Co., New Britain, Conn.

Yost Mfg. Co., Meadville, Pa.

Vises, Milling Machine

Carter & Hakes Mcbe. Co., W. Winsted, Conn.

Cochrane-Bly Co., Rochester, N. Y.

Edlund Machinery Co., Inc., Cortland, N. Y.

Hardinge Brothers, 1770 Hertau Av., Chicago

Hartford Special Mchry. Co., Hartford, Conn.

Hollands Mfg. Co., Erie, Pa.

Nestor Mfg. Co., 40 W. 13th St., New York

Sellew Machine Tool Co., Pawtucket, R. I.

Spafford Tool Works, Hartford, Conn.

Stephens Co., John, Cincinnati

Yost Mfg. Co., Meadville, Pa.

Vises, Shaper

Stephens Co., John, Cincinnati

Washing Machines for Cleaning Metal Parts

Niven Mfg. Co., 843 Larrabee St., Chicago

Wood Working Machinery

Chicago Mchry. Exchange, 1211-27 Washington

Bld., Chicago

Hendley & Whittemore Co., Beloit, Wis.

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Index of Advertisers

Abbott Ball Co.....	60	Bennett Co., W. R.....	122
Abrasive Machine Tool Co.....	79	Bickett Machine & Mfg. Co.....	31
Acme Machine Tool Co.....	9	Biggs-Watterson Co.....	180
Adams Manufacturing Co., O. R.....	20	Bignall & Keeler Mche. Works...	103
Ainslie Machine & Tool Works..	58	Blount Co., J. G.....	73
Alert Tool Co.....	52	Boker Cutlery & Hardware Co...	148
Allen Machinery Co., B. C.....	168	Bonney Vise & Tool Works.....	190
American Milling Machine Co....	134	Boston Scale & Machine Co.....	114
Anderson Bros. Mfg. Co.....	96	Boye & Emmes Mche. Tool Co.	21
Armstrong-Blum Mfg. Co.....	121	Bristol Machine Tool Co.....	74
Armstrong Bros. Tool Co.....	104	Broadway Machinery Co.....	184
Atlas Press Co.....	100	Brown-McDonald Mch. Co.....	161
Aurora Tool Works.....	53	Brown & Sharpe Mfg. Co.....	5
Austin Tool & Machine Co., Inc.	112	Brownell Machinery Co.....	153
Badger-Packard Mch. Co.....	166	Buchanan Chemical Co., C. G....	127
Badger Tool Co.....	89	Buchanan Co., Thos.....	126
Barr, H. Edul.....	116	Bunting Brass & Bronze Co.....	105
Barrett Machine Tool Co.....	34	Burke Machine Tool Co....48-132-	170
Barry Manufacturing Co.....	29		
Bartlett, Edwin E.....	101	Canedy-Otto Mfg. Co.....	55
Bath & Co., Cyril J.....	156-157	Canton Foundry & Mche. Co.....	26
Beaman & Smith Co.....	59	Carroll Mfg. Co., L. W.....	84
Beaudry & Co.....	116	Carter & Hakes Machine Co....	136
Becker Milling Machine Co.....	131	Chard Lathe Co.....	19
Bell & Gossett Co.....	126	Chattanooga Machinery Co.....	115
Bennett Machinery Co., G. L....	188	Chicago Machinery Exchange....	176
		Cincinnati Automatic Mch. Co...	7

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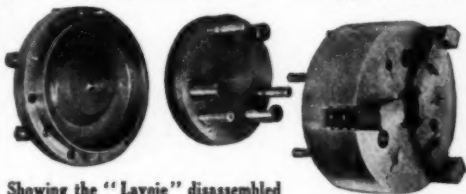
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Index of Advertisers—Continued

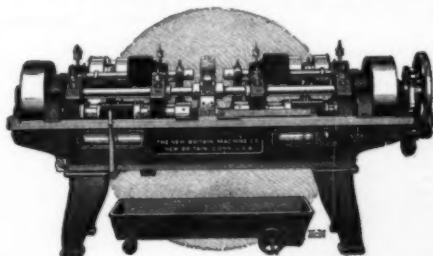
Cincinnati Ball Crank Co.....	120	Harris Engineering Co., H. E.....	50-78
Cincinnati Planer Co.....	6	Hartford Special Machinery Co....	104
Cincinnati Pulley Mch. Co.....	45	Heald Machine Co.....	129
Cincinnati Specialty Mfg. Co.....	142	Hendley & Whittemore Co.....	93
Cincinnati Vise Co.....	150	Henry & Wright Mfg. Co.....	43
Cleveland Belting & Mch. Co.....	168	Herth Mfg. Co., O. B.....	28
Cleveland Flue Cleaner Mfg. Co.....	130	High Speed Hammer Co.....	49-145
Clough, R. M.....	138	Hill, Clarke & Co., of Chicago....	173
Cochrane-Bly Co.....	119	Hinckley Machine Works.....	140
Columbia Machine Tool Co.....	110	Hoggson & Pettis Mfg. Co.....	68
Contract Work Wanted.....	190	Hollands Manufacturing Co.....	150
Conway & Co.....	66		
Craftsman Tool Co.....	4	Independent Pneumatic Tool Co.....	46
Cross Gear & Engine Co.....	107		
Cushman Wheel Co.....	124	Jacobs Mfg. Co.....	63
Cushman Chuck Co.....	64	Johnson & Sons Mch. Co., Wm. C.	162
Dale-Brewster Mch. Co.....	183	Kinsey Co., E. A.....	158
Dalton Manufacturing Corp.....	23	Knickerbocker Co.....	149
Davenport Manufacturing Co.....	132	Knight Machinery Co., W. B.....	61
Davie Tool Co.....	106		
Davis Machine Tool Co.....	113		
Demco Machine Tool Co.....	42	Lambert Mche. & Engineering Co.....	36
Dickow, Fred. C.....	144	Lapointe Co., J. N.....	4
		LaSalle Tool Company.....	77
Edgemont Machine Co.....	66	Lee Co., Frank H.....	30
Edlund Machinery Co., Inc.....	57	Lewis-Shepard Co.....	27
Enterprise Machinery Co.....	94	Lewthwaite Co., George A.....	91
Esley Machinery Co., E. L.....	157	Lewthwaite Machine Co., T. H.....	96
Etna Manufacturing Co.....	110	Long & Allstatter Co.....	92
Euclid Crane & Hoist Co.....	26	Loshbough-Jordan T. & M. Co.....	94
		Lourie Mfg. Co.....	100
Federal Machinery Sales Co.....	158	Lucas & Son, Inc., J. L.....	175-184
Fenn Mfg. Co.....	78	Lynd-Farquhar Co.....	182
Fincham, H. C.....	153		
Fitzgerald & Co., W. H. J.....	180	McCabe Lathe & Machinery	
Frontier Chuck & Tool Co.....	199	Corporation, J. J.....	186-187
		McCoy-Brandt Machinery Co.....	162
Genesee Manufacturing Co., Inc.....	139	McCrosky Tool Corporation.....	65
Geuder, Paeschke & Frey Co.....	190	McDonough Mfg. Co.....	72
Giddings & Lewis Mfg. Co.....	33	McLaughlin & Co., A. A.....	168
G-L Sales Company.....	86	McMullen Machinery Co.....	182
Girard Machine & Tool Co.....	160	Machineshop Equipment Corp'n.....	176
Gits Bros. Mfg. Co.....	120	Madison Manufacturing Co.....	52
Gooley & Edlund, Inc.....	136	Manhattan Mche. & Tool Works.....	95
Grand Rapids Grinding Mche. Co.....	80	Marchke Manufacturing Co., Inc.....	85
Grant Mfg. & Machine Co.....	98	Marsh Co., H. C.....	153
Graves Machinery Exchange.....	181	Marshall & Huschart Mch. Co.....	178
Greaves-Klusman Tool Co.....	8	Martin Tool & Die Co., J. E.....	148
Greenfield Machine Co.....	81	Mauch Chunk Iron Works.....	190
Greenfield Tap & Die Corp'n.....	71	Michigan Tool Co.....	130
Gwilliam Company, The.....	60	Minster Machine Co.....	42
		Modern Tool Co.....	203
Hamilton Caster & Mfg. Co.....	198	Molitor Machinery Co., Chas.....	167
Hammond Manufacturing Co.....	37	Monarch Machine Tool Co.....	18
Hardinge Bros., Inc.....	24	Morse Chain Co.....	122
Harris Brothers Co.....	154	Motch & Merryweather Mch. Company.....	177
		Mueller Machine Tool Co.....	38
		Mutchey Machine & Tool Co.....	58

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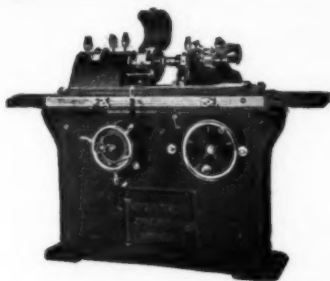
**Automatic
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**New Britain,
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U.S.A.**

Index of Advertisers—Continued

National Acme Company.....	3	Smith Machinery Co., H. A.....	178
National Clutch Co.....	68	Smith Mfg. Co., Philip.....	16
National Mch. Tool Co., Cincinnati	112	Smurr & Kamen Co.....	12
National Mche. Tool Co., Racine	84	South Bend Lathe Works.....	17
Nelson-Blanch Mfg. Co.....	44	Spafford Tool Works.....	146
Nestor Mfg. Co., Inc.....	146	Stober Machine Co.....	190
New Britain Mche. Co.....	190-201-204	Steinle Turret Machine Co.....	11
Newman Manufacturing Co.....	16	Stephoe Company, John.....	109
Nicholson & Co., W. H.....	97	Stickley Mchy. Co., E. B.....	170
Nielsen-Barton Chuck Co.....	64	Stocker-Rumely-Wachs Co.....	163
Niles-Bement-Pond Co.....	165	Stow Flexible Shaft Co.....	88
Nivin Manufacturing Co., Inc.....	25	Strand & Co., N. A.....	88
North Side Tool Co.....	106	Strong, Carlisle & Hammond Co.	166
O'Brien Machinery Co.....	170	Taylor & Fenn Co.....	41
Osborne & Sexton Mchy. Co.	108-171	Terrell's Equipment Co.....	151
Osgood, J. L.....	169	Thomas Elevator Co.....	62
Ott Grinder Co.....	72	Thompson Co., C. M.....	170
Partridge, E. O.....	98	Thompson Grinder Co.....	75
Pawling & Harnischfeger Co.....	36	Toledo Screw Products Co.....	189
Pedrick Tool & Machine Co.....	143	Toomey, Inc., Frank.....	169
Peerless Machine Co.....	125	Towsley Mfg. Co., John T.....	24
Peninsular Machinery Co.....	167	Tucker, W. C. & F. C.....	141
Perfection Auto Parts Co.....	190	Turner Machine Co.....	35
Peter Bros. Mfg. Co.....	54-118		
Prestiss & Co., Henry.....	174	Underwood Corporation, H. B.....	152
Pyott Foundry Co.....	90	United States Mche. Tool Co.....	135
Quickwork Co.....	92	Van Dorn Electric Tool Co.....	40
Racine Tool & Machine Co.....	123	Vonnegut Machinery Co.....	172
Ready Tool Co.....	138		
Reed Co., Francis.....	38	Walsh Machinery Co., M. J.....	188
Reid Brothers Co., Inc.....	117	Waltham Machine Works.....	137
Reliance Elect. & Engineering Co.	2	Walton Co.....	56
Reliance Machinery Sales Co.....	169	Warner, H. D.....	164-167-171
Rhodes Mfg. Co.....	111	Waterston, J. M.....	50
Richards, Anson W.....	153	Way Co., A. F., Inc.....	28
Rickert-Shaler Co.....	51	Wayne Machinery Co.....	185
Rigid Tool Holder Co.....	10	Weaver Mfg. Co.....	99
Ritchie-Wertz Co.....	128	Webster & Perks Tool Co.....	69
Robbins, Gamwell & Co.....	190	White Machinery Co., A. D.....	160
Rockford Drilling Machine Co. ..	32	Whiting & Comstock.....	140
Rockford Iron Works.....	102	Whitney Mfg. Co.....	133
Russell Machine Co., Inc.....	155	Whitney & Son, Baxter D.....	70
Savage Co., W. J.....	118	Wicks Brothers.....	128
Schipper Machine & Tool Co.....	144	Willard Machine Tool Co.....	15
Schmidt Co., B. L.....	74	Willard Press & Tool Co.....	102-142
Scully-Jones & Co.....	67	Wilmarth & Morman Co.....	76
Second-Hand Machinery.....	153 to 189	Winterer, Herman L.....	164
Sellew Machine Tool Co.....	44	Wisconsin Electric Co.....	82-83
Sidney Machine Tool Co.....	14	Wood Turret Machine Co.....	13
Silver Manufacturing Co.....	39	Worcester Lathe Co.....	22
Simmons Machine Co.....	87-179	Workwell Eng. & Mfg. Co.....	54
Sipp Machine Co.....	47	Wright, David A.....	159
Smith & Mills Co.....	108		
		Yohe Supply Co., Wm. S.....	56
		Yost Manufacturing Co.....	147



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